तेनजिंग नोरगे

दुर्गा प्रसाद शुक्ल

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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प्रकाशन सहयोग

सी.एन. राव: अध्यक्ष प्रकाशन विभाग

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प्रकाशन विभाग के सचिव, राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्, श्री अरविंद मार्ग, नई दिल्ली 110016 द्वारा प्रकाशित, ग्राफिक कम्पोज़र्स, 45/- सेन्ट्रल मार्केट, सफदरजंग एन्क्लेव, नई दिल्ली 110029 द्वारा फोटो कम्पोज़ होकर राकेश प्रेस, ए-7, नारायण इंडस्ट्रियल एरिया, फेज़ II, नई दिल्ली 110028 द्वारा मुद्रित।

प्राक्कथन

विद्यालय शिक्षा के सभी स्तरों के लिए अच्छे शिक्षाक्रम, पाठ्यक्रमो और पाठ्यपुस्तकों के निर्माण की दिशा मे हमारी परिषद् पिछले पच्चीस वर्षों से कार्य कर रही है। हमारे कार्य का प्रभाव भारत के सभी राज्यों और संघशासित प्रदेशो में प्रत्यक्ष और अप्रत्यक्ष रूप से पडा है और इस पर परिषद् के कार्यकर्ता संतोष का अनुभव कर सकते है।

किन्तु हमने देखा है कि अच्छे पाठ्यक्रम और अच्छी पाठ्यपुस्तकों के बावजूद भी हमारे विद्यार्थियों की रुचि स्वत: पढ़ने की ओर अधिक नही बढ़ती। इसका एक मुख्य कारण अवश्य ही हमारी दूषित परीक्षा प्रणाली है जिसमें पाठ्यपुस्तकों में दिए गए ज्ञान की ही परीक्षा ली जाती है। इस कारण बहुत ही कम विद्यालयों मे कोर्स के बाहर की पुस्तकों को पढने के लिए प्रोत्साहन दिया जाता है लेकिन अतिरिक्त पठन मे बच्चो की रुचि न होने का एक बडा कारण यह भी है कि विभिन्न आयुवर्ग के बच्चों के लिए कम मूल्य की अच्छी पुस्तकें पर्याप्त संख्या में उपलब्ध नही हैं। यद्यपि पिछले कुछ वर्षों में इस कमी को पूरा करने के लिए कुछ काम प्रारंभ हुआ है पर वह बहुत ही नाकाफी है।

इस दृष्टि से परिषद् ने बच्चो के लिए पुस्तक लेखन की दिशा में एक महत्वाकांक्षी योजना प्रारंभ की है। इसके अंतर्गत "पढ़ें और सीखें" शीर्षक से एक पुस्तकमाला तैयार करने का विचार है जिसमें विभिन्न आयुवर्ग के बच्चों के लिए सरल भाषा और रोचक शैली में अनेक विषयों पर बड़ी संख्या में पुस्तकें तैयार की जाएंगी। हम आशा करते हैं कि 1989 के अत तक हम निम्नलिखित विषयों पर हिन्दी में 100 पुस्तकें प्रकाशित कर सकेंगे।

(क) शिशुओं के लिए पुस्तकें
(ख) कथा साहित्य

(ग) जीवनियाँ
(घ) देश-विदेश परिचय
(ङ) सांस्कृतिक विषय
(च) वैज्ञानिक विषय
(छ) सामाजिक विज्ञान के विषय

हम पुस्तकों के निर्माण में लेखकों, अनुभवी अध्यापकों और योग्य कलाकारों का सहयोग ले रहे हैं। प्रत्येक पुस्तक के प्रारूप पर भाषा, शैली और विषय-विवेचन की दृष्टि से सामूहिक विचार करके इसे अंतिम रूप दिया जाएगा।

परिषद् इस माला की पुस्तकों को लागत-मूल्य पर ही प्रकाशित कर रही है ताकि वे अपने देश के सभी कोनों में पहुँच सकें। भविष्य में इन पुस्तकों का अन्य भारतीय भाषाओं में अनुवाद कराने की भी योजना है।

हम आशा करते हैं कि शिक्षाक्रम, पाठ्यक्रम और पाठ्यपुस्तकों के क्षेत्र में किए गए कार्य की भांति ही परिषद् की इस योजना का भी व्यापक स्वागत होगा।

प्रस्तुत पुस्तक के लेखन के लिए श्री दुर्गा प्रसाद शुक्ल ने हमारा निमंत्रण स्वीकार किया जिसके लिए हम उनके अत्यंत आभारी हैं। जिन-जिन विद्वानों, अध्यापकों और कलाकारों से इस पुस्तक को अंतिम रूप देने में हमें सहयोग मिला है उनके प्रति मैं कृतज्ञता ज्ञापित करता हूँ।

परिषद् में यह योजना प्रोफेसर अनिल विद्यालंकार के मार्ग-दर्शन में चल रही है। उनके सहयोगियों में श्रीमती संयुक्ता लूदरा, डा. रामजन्म शर्मा, डा. सुरेश पाण्डेय, डा. हीरालाल बाछोतिया और डा. अनिरुद्ध राय सक्रिय सहयोग दे रहे हैं। विज्ञान की पुस्तकों के लेखन का कार्य हमारे विज्ञान एवं गणित शिक्षा विभाग के डा. रामदुलार शुक्ल देख रहे हैं। योजना के संचालन में डा. बाछोतिया विशेष रूप से सक्रिय रहे हैं। मैं अपने सभी सहयोगियों को हार्दिक धन्यवाद और बधाई देता हूँ।

हम माला की पुस्तकों पर बच्चों, अध्यापकों और बच्चों के माता-पिता की प्रतिक्रिया का स्वागत करेंगे ताकि उनसे इन पुस्तकों को और भी उपयोगी बनाने में हमें सहयोग मिल सके।

पी.एल. मल्होत्रा
निदेशक

गांधी जी का जन्तर

तुम्हे एक जन्तर देता हूं। जब भी तुम्हें सन्देह हो या तुम्हारा अहम् तुम पर हावी होने लगे, तो यह कसौटी आजमाओ:

जो सबसे गरीब और कमजोर आदमी तुमने देखा हो, उसकी शकल याद करो और अपने दिल से पूछो कि जो कदम उठाने का तुम विचार कर रहे हो, वह उस आदमी के लिए कितना उपयोगी होगा। क्या उससे उसे कुछ लाभ पहुंचेगा? क्या उससे वह अपने ही जीवन और भाग्य पर कुछ काबू रख सकेगा? यानि क्या उससे उन करोड़ों लोगो को स्वराज्य मिल सकेगा जिनके पेट भूखे है और आत्मा अतृप्त है?

तब तुम देखोगे कि तुम्हारा सन्देह मिट रहा है और अहम् समाप्त होता जा रहा है।

मो० क० गांधी

विषय सूची

चोमो-लुंगमा : उस पर पक्षी भी नहीं उड़ सकता

धूप में चमकते उँचे-उँचे पहाड़। बर्फ की चादर लपेटे। उन्हीं पहाड़ों के बीच एक और पहाड़ है। लगता है, वह आसमान छू रहा है। कभी बादलों में घिरा। कभी धूप में चमकता।

प्रतिदिन इस पहाड़ को देखता है। वह अचरज से भर जाता है। गाँव वाले इस पहाड़ का आदर करते हैं। मन ही मन उसकी पूजा करते हैं। एक दिन वह अपनी माँ से पूछता है — 'माँ, इस पहाड़ का नाम क्या है?'

'बेटा, वह चोमो-लुंगमा है। सारे विश्व की जननी, देवी। वह पवित्र है। वहाँ देवता रहते हैं। वह बहुत ऊँचा है। इतना ऊँचा कि कोई पक्षी तक उसके ऊपर नहीं उड़ सकता।

बेटे को और भी अचरज होता है। इतना ऊँचा पहाड़! कोई पक्षी तक उस ऊपर नहीं उड़ सकता!

भविष्य को कोई नहीं जान पाया है। उस किशोर को भी अपने भविष्य का पता नहीं था। तब वह क्या जानता था-एक दिन वह उसी पहाड़ की चोटी पर चढ़ेगा। सारी दुनिया में उसका नाम हो जाएगा। लोग उससे प्रेरणा लेंगे। कहेंगे-उसने असंभव को संभव कर दिखाया। सबसे ऊँचे पर्वत पर चढ़नेवाला वह पहला आदमी बना।

चोमो-लुंगमा

अर्थात् माउंट एवरेस्ट। इस पर्वत शिखर को सारी दुनिया इसी नाम से जानती है। पर कुछ लोगों के लिए वह चोमो-लुंगमा

है। चोमो लुंगमा यानी 'विश्व की जननी, देवी'। ये लोग इसी पहाड़ के आसपास रहते हैं। दुनिया उन्हें एक नाम से ही जानती है। यह नाम है, शेरपा। लोग 'शेरपा' का मतलब कुली से लगाते हैं। शेरपा यानी कुली, शेरपा यानी 'गाइड'। पहाड़ों पर रास्ता बतलाने वाला। पर शेरपा का यह मतलब सही नहीं है। शेरपा एक जाति का नाम है। एक समुदाय का नाम है। ये लोग पूर्वी हिमालय में ऊँचे स्थानों पर रहते हैं।

वह किशोर भी शेरपाओं में से एक था। तब उसका नाम गाँव के लोग ही जानते थे। पर आज? आज सारी दुनिया उसका नाम जानती है। उसका नाम एवरेस्ट से जुड़ा हुआ है। एवरेस्ट का नाम लेते ही उसका नाम याद आता है। उसका नाम है तेनजिंग नोरगे।

तेनजिंग नोरगे।

एवरेस्ट-विजेता।

एडमंड हिलेरी के साथ एवरेस्ट पर चढ़ने वाला विश्व का पहला व्यक्ति।

सन् 1953 तक एवरेस्ट पर कोई नहीं चढ़ पाया था। यों, कई लोगों ने उस पर चढ़ने की कोशिश की थी। कई लोगों ने इस प्रयास में अपने प्राण भी गँवा दिए थे।

एवरेस्ट एक चुनौती बना हुआ था। मनुष्य के साहस के लिए एक चुनौती। लगता था, एवरेस्ट सदा अविजित रहेगा। कोई उस पर नहीं चढ़ पाएगा। पर मनुष्य में एक खूबी है। वह कभी हार नहीं मानता। हर असफलता उसे प्रेरणा देती है। वह असफलता को सफलता की सीढ़ी मानता है। वह अपनी गलतियाँ ढूँढ़ता है। उन्हें दूर करता है। फिर दुगुने उत्साह से नया प्रयत्न करता है। वह हार नहीं मानता। और एक दिन विजयी होता ही है।

तेनजिंग नोरगे ने भी एवरेस्ट पर चढ़ने की कई बार

कोशिश की। सफल नहीं हुए। पर वे निराश भी नहीं हुए। कोशिश करते ही रहे। और एक दिन वे सफल हो ही गए।

वह एक महत्वपूर्ण दिन है—इतिहास में सदा के लिए अमर। यह दिन था—29 मई 1953 का। इसी दिन मनुष्य ने एवरेस्ट पर विजय पाई थी।

आज तेनजिंग हमारे बीच नहीं हैं। पर उनका जीवन हमें प्रेरणा देता है पर्वतों पर चढ़ने की, बाधाओं से जूझने की, कभी निराश न होने की।

कैसा था तेनजिंग नोरगे का जीवन? कैसा था उनका बचपन?

सोलो खुम्बु: दो गाँव-एक नाम

नेपाल। हमारा पड़ोसी देश। हिमालय की पहाड़ियों के बीच बसा। उत्तर पूर्वी नेपाल में कई गांव हैं। पहाड़ों के बीच बसे इन्हीं गांवों में दो गांव हैं-सोलो और खुम्बू। पर लोग उनका नाम एक साथ लेते हैं। मानों यह एक गांव का नाम है। वास्तव में ये जिलों के भी नाम हैं। सोलो एक जिला है, और खुम्बू दूसरा। सोलो दक्षिण में है। कम ऊँचाई पर। खुम्बू ज्यादा ऊँचाई पर है। तेनजिंग नोरगे इसी खुम्बू के निवासी थे।

उनके पूर्वज तिब्बत के रहने वाले थे। वे हिमालय के दर्रों से होकर नेपाल आए थे। वे खुम्बू में ही बस गए। खुम्बू बहुत ऊँचाई पर है। गगनचुंबी पहाड़ों के बहुत पास। बहुत कुछ तिब्बत के समान। तेनजिंग और उनके जैसे शेरपा खुम्बू के इसी उत्तरी इलाके से आए थे। सोलो-खुम्बू से दूधकोसी बहती है। दूधकोसी अर्थात् दूध की नदी। यह नदी कहाँ से आती है?

एवरेस्ट के आसपास पहाड़ हैं। बर्फ से ढँके। दूधकोसी इसी बर्फीले प्रदेश से आती है। कई धाराओं में। गहरी घाटियाँ। खतरनाक खड्ड। कहीं सीधी-सपाट, कहीं आड़ी-तिरछी पगडंडियाँ। संकरे-झूलते पुल। उन पर कष्टों से भरा सफर। हर पग पर खतरा। काठमांडू-नेपाल की राजधानी। वहाँ तक जाने का यही एक मार्ग।

तेनजिंग नोरगे ने अपनी आत्मकथा में लिखा है–"मेरा प्रदेश कठोर और पथरीला है। जलवायु तीखी है। फिर भी हमारी

खेती है। चरागाह हैं। आठ से दस हजार की ऊँचाई पर गेहूं उगाया जाता है। सोलो में गेहूं ज्यादा होता है। चौदह हजार फुट की ऊँचाई पर आलू पैदा होता है। जौ भी होता है। आलू हमारी सबसे बड़ी उपज है। आलू ही हमारा मुख्य खाद्य पदार्थ है। कुछ जमीन पर सब का अधिकार है। कुछ जमीन निजी है। कई परिवारों की जमीन अलग-अलग जगहों पर है। बुआई और कटाई के लिए वे ऊपर से नीचे आते हैं। लोग अपने मवेशियों के साथ यात्रा करते हैं। इन मवेशियों में होते हैं-भेड़, बकरियाँ और याक। इनमें याक का बड़ा महत्त्व है। उनसे हमें वस्त्रों के लिए ऊन मिलता है। जूतों के लिए चमड़ा ईंधन के लिए गोबर। भोजन के लिए दूध, मक्खन और पनीर। सभी हिमालयी लोगों के लिए याक जीवन का महान अधार है। उसे जिंदा रहने के लिए याक से सारी चीज़ें मिल जातीं हैं।

सोलो-खुम्बू में कोई नगर नहीं है। कस्बा तक नहीं है। खुम्बू में सबसे बड़ा एक गाँव है। उसका नाम है नामचे बाजार। घाटियों में कई गाँव बसे हैं। इनके नाम हैं-खुमजुंग, पांडाबोचे, दामदंग, शाक-सुम, शिमबुंग और थामे। इन गांवों में घर पत्थरों के बने हैं। इनकी छतें लकड़ी की हैं। दरवाजे और खिड़कियाँ भी लकड़ियों की हैं। खिड़कियों में कांच के पल्ले नहीं होते। अधिकांश घर दो मंजिला हैं। निचली मंजिल में मवेशी रखे जाते हैं। स्टोर होता है। भीतर ही भीतर सीढ़ियाँ होती हैं। इनसे ऊपर की मंजिल में जाने का रास्ता होता है। ऊपर की मंजिल में लोग रहते हैं।

जन्म : कब और कहाँ ?

सोलो-खुम्बू में ही एक गांव है थाम। तेनजिंग नोरगे का परिवार यहीं रहता था। थामे में ही तेनजिंग पले और बढ़े। पर

उनका जन्म थामे में नहीं हुआ था। उनका जन्म त्सा-चू नामक स्थान में हुआ था। यह महान पर्वत मकालू के पास है। एवरेस्ट का वहाँ से केवल एक दिन का रास्ता है। त्सा-चू का अर्थ है—उष्ण निर्झर। गरम पानी का झरना। यह एक पवित्र स्थान है।

कहानियों में इतिहास भी छिपा होता है। त्सा-चू और चांग-ला के बारे में भी कई कहानियाँ हैं। ऐसी ही एक कहानी यह है।

पुराने जमाने की बात है। दो राजा थे। एक का नाम था—ग्यालबो वांग। दूसरे का -ग्यालबो खुंग। किसी बात पर दोनों में विवाद हो गया। युद्ध ठन गया। यह युद्ध त्सा-चू और चांग के पास हुआ। इस युद्ध में ग्यालबो खुंग की विजय हुई। उसने अपने सिपाहियों में, सरदारों में जमीन बांटी। एक योद्धा को चांग-ला के पास जमीन मिली। योद्धा ने अपने नाम के आगे चांग-ला लगा लिया। आज भी कई लोगों के नाम के साथ उनके शहर का नाम जुड़ा हुआ रहता है। उस योद्धा के वंशजों ने भी यही नाम अपना लिया। इसी वंश में तेनजिंग नोरगे का जन्म हुआ।

तेनजिंग का जन्म कब हुआ? बतलाना जरा कठिन है। इसका एक कारण है। सोलो-खुम्बू में तिब्बती पंचांग चलता है। उसी से काल गणना की जाती है। उसमें वर्षों के लिए संख्या नहीं होती। उसमें वर्षों के नाम होते हैं। ये नाम पशु-पक्षियों के नामों पर होते हैं। जैसे अश्व-वर्ष, चीता-वर्ष, वृषभ वर्ष, सर्प-वर्ष, पक्षी-वर्ष। ऐसे कुल बारह वर्ष होते हैं। इनमें छः वर्ष नर-वर्ष हैं। शेष छः मादा-वर्ष हैं। जब एक क्रम पूरा हो जाता है तो फिर दूसरा शुरू होता है। कई बरसों तक तेनजिंग को अपनी उम्र का पता ही नहीं था। बस, एक बात ही मालूम थी। वह यह कि वे योआ-वर्ष में पैदा हुए थे। योआ यानी खरगोश। यह चक्र चलता

रहता है। इसलिए ईस्वी सन् के साथ उसकी तुलना कठिन है। तेनजिंग के अनुसार उनका जन्म शायद 1914 में हुआ था।

ईस्वी सन् बतलाना भले कठिन हो, पर तेनजिंग को अपने जन्म की ऋतु याद थी। उनका जन्म मई के दूसरे पखवाड़े में हुआ था। यह समय उनके लिए सदैव शुभ रहा। उनकी जिंदगी में मई का दूसरा पखवाड़ा हमेशा महत्वपूर्ण रहा। कैसे? सन् 1952 की बात है, मई का दूसरा पखवाड़ा था। उस वर्ष भी एवरेस्ट पर एक अभियान-दल गया था। उसमें प्रसिद्ध पर्वतारोही लैम्बर्ट थे। उनके साथ तेनजिंग भी थे। 28 मई की बात है। वे लोग एवरेस्ट पर लगभग चढ़ गए थे। पर शिखर तक नहीं चढ़ पाए। लेकिन पहली बार कोई मनुष्य उस ऊँचाई तक पहुँचा था। अंततः उन्हें लौटना पड़ा। पर वे निराश नहीं थे। एक आशा थी, मन में एक संकल्प था।–'हम फिर आएंगे।' और ठीक एक वर्ष, एक दिन बाद की बात है। वे हिलेरी के साथ एवरेस्ट पर थे।

29 मई: एक ऐतिहासिक दिन।

हर 29 मई को एवरेस्ट विजय की वर्षगांठ मनायी जाती रहेगी। इसलिए तेनजिंग ने भी 29 मई को ही अपना जन्म–दिन मान लिया।

तेनजिंग नोरगे की माँ का नाम है, किन जोम। पिता का चांग–ला मिंगमा। उनकी तेरह संतानें हुईं। सात पुत्र। छह पुत्रियाँ। तेनजिंग माता–पिता की ग्याहरवीं संतान थे।

सोलो–खुम्बू में जीवन बहुत कष्टकर था। तेनजिंग नोरगे के अनुसार, "वहां मौत हमेशा मंडराती रहती थी। मेरे भाई–बहनों में केवल चार बचे। एक मैं। तीन बहनें।" सोलो–खुम्बू दुर्गम प्रवेश में है। वहां के लोग बहुत कम मैदानों में आते हैं। कारण, रास्ता खतरनाक है। कठिनाइयों से भरा। जो लोग मैदानों में आते, वे बहुत कम वापस लौटते। मैदानों में ही बस जाते। काठमांडू में रहने लगते। या फिर दार्जिलिंग चले

जाते। तेनजिंग के माता-पिता ने कभी बाहर की दुनिया नहीं देखी। ज्यादा से ज्यादा वे काठमांडू तक गए। या फिर तिब्बत में रोंगबुक मठ में गए। रोंगबुक मठ में तेनजिंग के मामा मुख्य लामा थे। बौद्ध मठों में पूजा—पाठ करने वाले लोगों को लामा कहते हैं।

तेनजिंग अर्थात 'भाग्यवान धर्म समर्थक'

हर नाम का एक अर्थ होता है। कुछ नाम देवी–देवताओं के नाम पर रखे जाते हैं। कुछ गुणों या विशेषणों के नाम पर। अपने देश में नाम रखने की एक प्रथा है। बच्चा जन्म लेता है। माता–पिता या संबंधी पंडित जी के पास जाते हैं। पंडित जी पंचांग देखकर नक्षत्र के अनुसार बच्चे का नाम रखते हैं। तिब्बत में भी ऐसी ही प्रथा है। वहाँ लामा बच्चे का नाम रखते हैं।

तेनजिंग के माता–पिता भी लामा के पास गए। पहले वे अपने बच्चे को और नाम से पुकारते थे। यह नाम था- नामग्याल वांग्डी। वे एक दिन नामग्याल वांग्डी को रोंगबुक मठ ले गए। वहाँ एक महान लामा थे। नामग्याल वांग्डी को उनके दर्शन कराये गए। महान लामा ने पवित्र ग्रंथों को देखा। फिर बताया, "सोलो–खुम्बू में हाल ही में एक धनी व्यक्ति के प्राण गए हैं। यह बच्चा उसी का अवतार है। इसीलिए इसका नाम जरूर बदला जाना चाहिए।

"अब आप ही बताइए नया नाम।" माता–पिता ने अनुरोध किया।

महान लामा ने फिर पवित्र ग्रंथों को देखा। कुछ देर विचार किया। फिर बोले, "इस बच्चे का नाम तेनजिंग नोरगे रखा जाए।"

फिर उन्होंने बच्चे का भविष्य बताया। कहा, "ये बच्चा संसार भर में प्रसिद्ध होगा। बड़ा आदमी बनेगा।।" माता–पिता बेहद खुश हुए। उन्हें यह बात एक और लामा ने बताई थी। ये लामा त्सि–चू मठ के थे।

तेनजिंग का अर्थ है- 'धर्म–समर्थक' यानी धर्म को मानने वाला। उसकी रक्षा करने वाला। और नोरगे का अर्थ है- 'धनी', 'भाग्यवान'।

इस तरह तेनजिंग नोरगे का अर्थ हुआ- 'धर्म–समर्थक, जो धनी है, भाग्यवान है।' या 'धनी, भाग्यवान धर्म–समर्थक'।

यह नाम बेहद पवित्र ओर शुभ माना जाता है।

रोंगबुक के उन महान् लामा का नाम भी तेनजिंग था। इस तरह उन्होंने नामग्याल वांग्डी को अपना ही नाम दे दिया था।

अपने नए नाम के बारे में तेनजिंग नोरगे लिखते हैं–– ''धनी, भाग्यवान, धर्म–समर्थक' नाम अच्छा था। इसलिए मेरे माता–पिता ने मेरा नाम बदल दिया। उन्हें आशा थी, इससे भला ही होगा।''

तेनजिंग लामा बनते–बनते रह गए

तेनजिंग नोरगे का प्यार से लालन–पालन होने लगा। उनके माता–पिता उन्हें लामा बनाना चाहते थे। तेनजिंग थोड़े बड़े हुए तो उन्हें एक मठ में भेजा गया। उनका मुंडन किया गया। उन्हें भिक्षुओं के वस्त्र पहनाये गए। वे अब मठ में ही रहने लगे।

मठ में एक घटना घट गई। उसने तेनजिंग के जीवन की धारा ही बदल दी। हुआ यह कि एक दिन एक लामा तेनजिंग पर नाराज हो गए। क्रोध में उन्होंने एक लकड़ी की पट्टी उठाई। उसे तेनजिंग के मुंडे सिर पर मारा। तेनजिंग दर्द से बिलबिला उठे। वे सीधे घर की ओर भागे।

उन्होंने माता–पिता को सारी बात बताई। कहा, ''अब मैं मठ में कभी नहीं जाऊँगा।''

उनके माता–पिता दयालु थे। वे अपने बच्चों को बेहद प्यार करते थे। उन्होने बेटे की बात मान ली।

तेनजिंग नोरगे ने लिखा है-

"आज मैं अक्सर सोचता हुँ, मेरे माता—पिता मेरी बात न मानते तो? मुझे दोबारा मठ में भेज देते तो? तब क्या होता? क्या तब मुझे लामा बन जाना चाहिए था? मैं नहीं जानता। कभी—कभी मित्रों में इस घटना का जिक्र करता हूँ। तब वे हँस कर कहते हैं, 'ओह, तो सिर पड़ी चोट ने ही तुम्हें पर्वतों के पीछे पागल बना दिया?"

सोलो—खुम्बू में तब कोई स्कूल नहीं था। आजकल नामचे बाजार में एक स्कूल है। छोटा-सा स्कूल, अब वहाँ के बच्चे पढ़ने—लिखने लगे हैं। पर तब? तब वहाँ कोई शाला नहीं थी। मठ में भी शिक्षा का कोई प्रबन्ध नहीं था। केवल लामा ही एक भाषा सीखते थे। यह उत्तरी बौद्ध धर्म की शास्त्रीय तिब्बती भाषा थी। वह भी केवल मौखिक रूप में पढ़ाई जाती थी।

बौद्ध मठ से भागकर तेनजिंग ने एक अवसर गंवा दिया। यह अवसर शिक्षा पाने का था। अब घर में वे अपनी उम्र के बच्चों के साथ खेला करते। घर के काम किया करते। वे अपने एक बड़े भाई की पीठ पर सवारी किया करते। उनके घर में मवेशियों का झुंड था। उन्हें सरदियों में घर की निचली मंजिल में बांध दिया जाता। जब मवेशी ठंड में बाहर निकाले जाते, तब उनसे अजीब—सी गंध आती थी। सरदियों में परिवार के लोग ऊपरी मंजिल में ठंसे पड़े रहते। जरा—सी भी जगह नहीं बचती। तब बड़ा शोर मचता था। रसोई का धुआं उठा करता था। चारों ओर एक गंध समायी रहती। पर वे सब प्रसन्न रहते, संतुष्ट होते। कारण? उन्हें जीवन का दूसरा ढंग मालूम नहीं था।

वे खाते—पीते, खेलते, या घर का काम करते। कुछ शेरपा बेहद कठोर होते थे। बच्चों को मारते—पीटते, डांटते—फटकारते रहते। तेनजिंग बताते हैं, उनके पिता कठोर नहीं थे। वे उन्हें बहुत चाहते थे। तेनजिंग भी पिता को प्यार करते थे।

उनका आदर करते थे। वे अपने पिता की हर बात मानते। उनका काम करने के लिए हमेशा तत्पर रहते।

तेनजिंग की एक बड़ी बहन थी। उनका नाम था- लहमू कीपा। वह भी अपने छोटे भाई को बेहद चाहती थी। वह याक का दूध दुहती तो तेनजिंग उस के पास बैठ जाते। लहमू कीपा उन्हें पीने के लिए याक का गरम–गरम, ताज़ा दूध दे दिया करती। तेनजिंग कहते थे, "लहमू कीपा मेरे लिए दूसरी माँ के समान थी।" बाद में लहमू कीपा भिक्षुणी बन गईं।

थ्यांग बोचे का बौद्ध मठ प्रसिद्ध है। इसी मठ में वे 'अबे–ला' बनीं। अबे–ला यानी बौद्ध भिक्षुणी। वे सात वर्षों तक वहाँ रहीं। उनके लिए तेनजिंग घर से भोजन ले जाया करते थे। बचपन में तेनजिंग की नजर एवरेस्ट पर सदा पड़ती थी। बचपन में उन्होंने एवरेस्ट का नाम तक नहीं सुना था। उत्तर दिशा में अनेक पर्वत शिखर थे। उन्हीं के मध्य एक शिखर आकाश में ऊँचा उठा हुआ था। उसे उन्होंने कई बार देखा था। पर तब उसका नाम एवरेस्ट नहीं था। वह चोमो–लुंगमा था। चोमो–लुंगमा यानी 'विश्वजननी देवी।' आम तौर पर इस शब्द का यही अर्थ था। पर तब वे इस नाम का अर्थ भी नहीं जानते थे। उनके लिए उसका एक ही अर्थ था। उनके लिए वह ऐसा पर्वत था, जिस पर से कोई पक्षी तक नहीं उड़ सकता था। शेरपा माँएं अपने बच्चों को यही अर्थ बतलाती थीं। तेनजिंग की माँ ने भी उन्हें यही नाम बतलाया था।

बचपन: छोटी दुनिया-बड़े सपने

अपने बचपन के बारे में तेनजिंग बताते हैं-

दूसरे बच्चों की तरह मेरी दुनिया भी बहुत छोटी थी। उस दुनिया में पिता थे, माँ थी, भाई–बहन थे, घर था, गांव था। खेत,

चरागाह और याक थे। उत्तर में महान पर्वत थे। पूर्व तथा पश्चिम में भी ऊँचे-ऊँचे पहाड़ थे। तीन दिशाओं में ऊँचे–ऊँचे पर्वत। चौथी दिशा दक्षिण थी। इस दिशा में दूधकोसी थी, जो जंगलों में गायब हो जाती थी। उसके पार क्या था, मैं नहीं जानता।

"जैसे–जैसे मैं बड़ा होता गया, बाहरी दुनिया के बारे में थोड़ा–बहुत ज्ञान होने लगा। सबसे पहले मैंने तिब्बत के बारे में जाना। फिर उसके पुण्य तीर्थ ल्हासा नगर के बारे में पता चला। ल्हासा के बारे में सभी लोग बातें करते। मेरे माता–पिता और लामा कई बार ल्हासा के बारे में चर्चा किया करते थे। मेरे माता–पिता धार्मिक प्रवृत्ति के थे। वे ल्हासा की तीर्थयात्रा करना चाहते थे। पर यह यात्रा बेहद लम्बी थी, खर्चीली भी थी। इसलिए वे कभी वहाँ नहीं जा पाए।"

बचपन में तेनजिंग स्वाभाव से शर्मीले थे। वे सबसे अलग-थलग रहा करते थे। और बच्चे एक दूसरे का पीछा करते हुए खेला करते थे। पर वे चुपचाप अकेले बैठे रहते। सुदूर स्थानों की, बड़ी–बड़ी यात्राओं की कल्पना किया करते। इसी में खोये रहते। कभी ऐसा दिखलाते, मानो ल्हासा के किसी महत्वपूर्ण व्यक्ति को पत्र लिख रहे हैं। एक दिन वह व्यक्ति आकर उन्हें ल्हासा ले जाएगा। कभी–कभी वे सोचते कि वे सेनापति हैं। एक सेना का नेतृत्व कर रहे हैं। कभी–कभी वे यात्रा करने के लिए पिता से घोड़े की मांग करते। तब पिता हँस पड़ते। तेनजिंग यात्रा करना चाहते थे। उनका मन करता था, घूमें, कहीं जाएं, कुछ देखें, कुछ पाएं।

तेनजिंग ल्हासा जाने के सपने देखा करते थे। तब वे किशोर थे। धीरे–धीरे उन्हें अन्य स्थानों के बारे में पता लगा। उन्होंने काठमांडू के बारे में सुना। उन्हें दार्जीलिंग का नाम मालूम पड़ा। अब वे इन स्थानों के बारे में भी सोचने लगे।

उन दिनों शेरपा काम की तलाश में सोलो–खुम्बू से निकल जाते थे। वे पर्वतों–जंगलों को पार कर काठमांडू जाते। कुछ साहसी शेरपा दार्जिलिंग तक पहुँच जाते। वहाँ वे चाय बागानों में काम करते। या दार्जिलिंग में रिक्शा चलाते, या कुली का काम करते। फिर वे अपने परिवार से मिलने सोलो–खुम्बु भी आते। वे गांव वालों को बाहरी दुनिया के बारे में बताते।

पर्वतों के लिए अभियान: शेरपाओं के लिए नया काम

पहले शेरपा चाय बागानों में काम करते थे। दार्जिलिंग में रिक्शा चलाते या बोझा उठाते थे। शीघ्र ही उन्हें एक नया काम मिल गया। वह काम था, पर्वतों पर जाने का।

डॉ. केल्लास नामक एक साहसी पर्वतारोही थे। वे हिमालय में खोज करना चाहते थे। उन्होंने अनुभव किया, शेरपा इस काम में उनकी मदद कर सकते हैं। उन्होंने शेरपाओं को एक नया काम दिया। पर्वतों में मार्ग दर्शन करने का, बोझा उठाने का।

शेरपा तो हिमालय के बेटे थे। उनके लिए यह काम कठिन नहीं था। डॉ. केल्लास की उन्होंने अच्छी सहायता की। उनके काम की प्रशंसा भी हुई। अब तो जो पर्वतारोही हिमालय में जाता, शेरपाओ को जरूर साथ लेता। इनमें से एक पर्वतारोही थे- जनरल ब्रूस। वे भारतीय सेना में थे। शेरपाओं ने उनकी भी खूब मदद की।

शीघ्र ही दार्जिलिंग के शेरपा प्रसिद्ध हो गये। वे पर्वतारोहियों का मार्गदर्शन करते। उनका सामान उठाते।

सन् 1921, 1922 और सन् 1924 में तीन प्रसिद्ध अभियान हुए। इन अभियानों में मंजिल थी- एवरेस्ट। संसार का सबसे ऊंचा पर्वत शिखर। इन अभियानों में दार्जिलिंग के कई शेरपा शामिल हुए। सोलो–खुम्बू से भी कई शेरपा गये।

शेरपाओं ने विदेशी पर्वतारोहियों को एक नया नाम भी दिया। यह था- चिलिंनान्गा। ये पर्वतारोही बड़े-बड़े जूते पहनते थे, उनके कपड़े भी खास तरह के होते थे। शेरपाओं ने अपने

जीवन में ऐसे जूते, ऐसे कपड़े कभी नहीं देखे थे।

तेनजिंग ने भी विदेशी पर्वतारोही देखे। उनके जूते, उनके कपड़े देखकर उनका मन ललच आया। एक जोड़ी जूतों के लिए उन्होंने पैसे भी दिये। पर वे बहुत बड़े थे। भारी भी बहुत थे। उनको पहन कर वे चल ही नहीं सकते थे। उन दिनों बस एक नाम की ही धूम थी- एवरेस्ट। बस एवरेस्ट। वे सब हमेशा एवरेस्ट की बात किया करते। एक दिन तेनजिंग ने शेरपाओं से पूछा, 'यह एवरेस्ट क्या है?'

'वही चोमो–लुंगमा।' उन्होंने उत्तर दिया। फिर आगे कहा, 'हम चोमो–लुंगमा के दूसरी ओर हैं। चिलिंनान्गा (विदेशी पर्वतारोही) कहते हैं कि वह संसार का सबसे ऊँचा पर्वत है।'

चोमो–लुंगमा अर्थात एवरेस्ट।

इसकी भी अपनी एक कहानी है।

प्रकृति की विचित्र लीलाः सागर की जगह पर्वत

हिमालय... किन्नरों और गंधर्वों का प्रदेश।

कालिदास एक महान कवि थे। उन्होंने हिमालय को 'नगाधिराज' कहा है। 'नगाधिराज' अर्थात पर्वतों का राजा।

बड़े अचरज की बात है।

आज जहाँ हिमालय है, वहाँ पहले कभी सागर था। उसका नाम था- टेथिस सागर।

हिमालय का जन्म कब हुआ था?

अनुमान है- आज से पाँच–छह करोड़ वर्ष पूर्व हिमालय की रचना हुई थी।

भूविज्ञानी बताते हैं-

प्राचीन काल में धरती दो खंडों में बंटी थी। उत्तरी भूखंड, दक्षिणी भूखंड थे। उत्तरी भूखंड से ये क्षेत्र बने- उत्तरी महाद्वीप, यूरेशिया। और दक्षिण भूखण्ड से बने- गोंडवाना, दक्षिणी भारत, अफ्रीका, आस्ट्रेलिया। इन दोनों भूखण्डों के बीच ही टेथिस सागर था। भूमध्यसागर इसी का अवशेष है। प्रकृति की लीला विचित्र है। इसी के कारण, जहाँ सागर था, वहाँ पर्वत बन गया।

हिमालय पर्वतमाला ढाई हजार किलोमीटर लम्बी है। उसका क्षेत्रफल पाँच लाख वर्ग किलोमीटर है।

प्राचीन काल में इस पर्वतमाला के कई नाम थे। जैसे इमस, हिमस या हीमोड। सिकंदर के साथ आये यूनानियों ने इसे 'भारतीय काकेशस' नाम से पुकारा। हिमालय को कई भागों में बांटा गया। ये हैं- वृहद हिमालय, लघु हिमालय, और बाह्य हिमालय।

भारत के लिए हिमालय का बड़ा महत्व है। उत्तर भारत के निर्माण में, उसका बड़ा हाथ है। उसके कारण जलवायु पर भी असर पड़ा है।

हिमालय न होता तो?

तो सिंध और गंगा का उपजाऊ मैदान विशाल रेगिस्तान होता। हिमालय के कारण ही उत्तर भारत में वर्षा होती है। गरमी के दिनों में दक्षिण–पश्चिमी मानसूनी हवाएं आती हैं। हिमालय उन्हें आगे नहीं बढ़ने देता। रोक लेता है। फलस्वरूप वर्षा होती है। वर्षा का पानी नदी बन कर निकलता है। ये नदियाँ अपने साथ उपजाऊ मिट्टी भी लाती हैं।

हिमालय एक और काम करता है। शीतकाल में उत्तरी ध्रुव से ठंडी हवाएं चलती हैं। उनके कारण मध्य एशिया का अधिकांश भाग जम जाता है। हिमालय इन ठंडी हवाओं को उधर ही रोक लेता है।

हिमालय में अनेक ऊँचे शिखर हैं। एवरेस्ट भी इनमें से एक है। संसार का सर्वोच्च पर्वत शिखर। इसकी वर्तमान ऊँचाई 29,028 फुट है, यानी 8,848 मीटर।

इस शिखर को नेपाल में 'सरगमाथा' कहते हैं।

इस शिखर का नाम एवरेस्ट क्यों पड़ा?

सन् 1841 की बात है।

तब भारत के सर्वेयर जनरल थे सर जार्ज एवरेस्ट। उन्होंने ही सबसे पहले इस शिखर का सर्वेक्षण किया था। इसी लिए इस शिखर का नामकरण उनके नाम पर किया गया।

एवरेस्ट सन् 1953 तक अविजित रहा। सबसे पहले सन् 1922 में एवरेस्ट पर चढ़ाई की गयी। इसके बाद सन् 1924, 1933, 1935, 1936, 1937, 1938, 1951 और 1952 में प्रयास किए गए। अंत में सन् 1953 में एवरेस्ट पर विजय पायी गई।

क्यों चढ़ते हो शिखर पर?

कैप्टेन मेलोरी!

एक विश्व प्रसिद्ध पर्वतारोही। उन्होंने अपने एक साथी के साथ एवरेस्ट पर चढ़ने की कोशिश की थी। साथी का नाम था- इरविन। उनके साथ कोई शेरपा नहीं था। उनके पास विशेष उपकरण भी नहीं थे। पर उनके पास एक बहुत बड़ी चीज़ थी। यह था- मन में उत्साह, दृढ़ इच्छा शक्ति, कभी हार न मानने का संकल्प।

क्या मेलोरी और इरविन शिखर तक, एवरेस्ट तक पहुँच पाए थे? यह रहस्य ही बना हुआ है। क्यों? इसलिए कि मेलोरी और इरविन कभी लौटकर नहीं आ पाए। उनके शवों तक का पता नहीं चला।

इन्हीं मेलोरी से किसी ने पूछा था-

''आप क्यों चढ़ते हैं शिखर पर?''

''क्योंकि वह सामने है?'' मेलोरी का उत्तर था।

क्या अर्थ है, इस उत्तर का? यही कि शिखर एक चुनौती देता है। और, साहसी व्यक्ति चुनौती से पीछे नहीं हटते। वे आगे बढ़कर उसे स्वीकार करते हैं। मेलोरी और इरविन ने भी यही चुनौती स्वीकार की थी।

आज एवरेस्ट पर मनुष्य पहुँच चुका है। तेनजिंग और हिलेरी के बाद कई लोग एवरेस्ट तक पहुँचे। इनमें अमरीका, जापान, और भी अन्य देशों के लोग है। अनेक भारतीय भी एवरेस्ट तक पहुंचे हैं। इनमें से एक हैं- मेजर हरिपाल सिंह अहलूवालिया। उनकी एक पुस्तक है- 'आस्मां और भी हैं।'

इसमें उनकी एवरेस्ट यात्रा के संस्मरण हैं। इस पुस्तक में एक जगह उन्होंने लिखा है-

"मैं समझता हूँ कि चोटी पर चढ़ पाना सफलता का एक अंग मात्र है। सफलता से भी अधिक पूर्णता या संतोष की वह भावना है, जो मानव को इसलिए प्रिय है कि वह अपने वातावरण पर विजय पा सका है और उससे ऊपर उठ सका है। दूसरे शब्दों में कहा जा सकता है कि मानव सदा साहसिक कामों की खोज में रहता है। और जोखिम से जूझना एवं अज्ञात को जानना उसकी प्रकृति का अंग है। चोटी पर चढ़ना शारीरिक अनुभव ही नहीं, बल्कि उससे भावनाओं को भी संतोष मिलता है। मैं तो यहाँ तक कहूंगा कि यह एक आत्मिक अनुभव है।"

सचमुच, जोखिम से जूझना आदमी की आदत है। अज्ञात को जानना उसका स्वभाव है। इसलिए तो आदमी इतनी तरक्की कर सका है। कहाँ आदिम मानव! कहाँ अंतरिक्ष तक पहुँचने वाला मानव! मनुष्य में जोखिम से जूझने की भावना नहीं होती, अज्ञात को जानने की जिज्ञासा नहीं होती, तो क्या मनुष्य इतनी प्रगति कर सकता था? शायद नहीं। तब शायद वह आज भी गुफाओं में ही रहता।

लेकिन मनुष्य का स्वभाव ऐसा नहीं है। वह सदा जोखिम से जूझता है। चुनौती स्वीकार करता है। अज्ञात के रहस्य खोलता है। उसके मन में एक जिज्ञासा होती है। इसी जिज्ञासा के कारण वह प्रकृति के नियम जान पाया है। सूर्य, चन्द्रमा, ग्रहों की गति जान पाया है। अंतरिक्ष में चन्द्रमा के धरातल तक पर उतर सका है।

इसमें मनुष्य ने खतरे भी बहुत उठाये हैं। जाने कितने लोगों के प्राण गए हैं। पर क्या मनुष्य पीछे हटा है? नहीं। पीछे हटना तो उसका स्वभाव ही नहीं है। एवरेस्ट अभियान में भी कई लोगों के प्राण गए हैं। मेलोरी और इरविन को भी अपने प्राण गंवाने पड़े।

पर क्या इससे लोग हिम्मत हार गए? नहीं। उन्हें लगा, अब तो एवरेस्ट पर चढ़ना और जरूरी है।

सन् 1922 में एक पर्वतारोही दल एवरेस्ट गया था। राह में बर्फ–स्खलन हो गया। बर्फ–स्खलन का अर्थ है, बर्फ का धंसना। उसमें सात शेरपाओं की मृत्यु हो गई। सोलो–खुम्बू दुःख के सागर में डूब गया। चारों ओर शोक छा गया। पर दो वर्ष बाद फिर एक पर्वतारोही दल आया। उनके साथ भी शेरपा गए। उस वर्ष तो और ज्यादा शेरपा दल के साथ थे। इसी वर्ष, सन् 1924 में, मेलोरी और इरविन लापता हुए। वे हिमालय में जैसे कहीं खो गए।

शेरपा लौटे तो उन्होंने गाँव वालों को उनके बारे में बताया। तेनजिंग नोरगे ने भी उनका नाम सुना। वे रोमांचित हो उठे। शुरू–शुरू में पर्वतारोहण अभियानों में तेनजिंग के परिवार से कोई नहीं गया। पर ऐसे अभियानों में जाने के लिए वे कुछ भी करने को तैयार थे। कुछ भी देने को तैयार थे। पर तब वे बहुत छोटे थे। इस तरह बचपन से तेनजिंग के मन में एक चाह जगी। पर्वतों पर चढ़ाई करने की। एवरेस्ट तक पहुँचने की। पर तब वे छोटे थे। पर्वतों पर जाने का प्रश्न ही नहीं था। कौन ले जाता छोटे बच्चे को अपने साथ?

सो, तेनजिंग घर के काम–काज में हाथ बंटाया करते। घर में कोई न कोई काम निकला ही करता था। उनके खेतों में आलू के अलावा जौ भी उगाया जाता था। भेड़ों और याकों की देखभाल का भी काम था। भेड़ें और याक बहुत उपयोगी पशु थे। उनसे उन्हें दूध मिलता, मक्खन मिलता, वस्त्रों के लिए ऊन भी मिलता।

नेपाल में पशुवध को अच्छा नहीं समझा जाता। बौद्ध लोग भी पशु हत्या नहीं करते। इसलिए याक कभी नहीं मारे जाते। पर वहाँ याक का खून निकाला जाता था। वह बहुत ताकतवर

समझा जाता था। खून निकालने से याक को भी लाभ हो जाता। कैसे? दिलचस्प बात है। पूरी गरमी याक भरपेट भोजन करते थे। इससे उनमें खून बढ़ जाया करता था। इसलिए वे ताकतवर भी हो जाते। ताकतवर हो जाते तो आपस में लड़ते। यहाँ–वहाँ अकारण दौड़ा–भागा करते। खून निकालने से वे शांत हो जाते।

तेनजिंग बताते थे कि शुरू–शुरू में उनका परिवार बहुत गरीब था। पर उन्हें भाग्यशाली समझा जाता था। परिवार के लोगों का ख्याल था, उनके जन्म के बाद उनके दिन फिर गये हैं। कारण, जिस वर्ष वे पैदा हुए, उसी वर्ष सौ नन्हें याक भी पैदा हुए। इसके बाद तो उनके घर कभी कभी तीन–तीन सौ, चार–चार सौ तक याक हो जाया करते!

इस तरह तेनजिंग का बचपन याकों के साथ भी बीता। उन्हें याकों के साथ पहाड़ों पर जाना अच्छा लगता था। वे याकों के साथ अठारह हजार फुट की ऊँचाई तक चले जाते। इस ऊँचाई तक याकों के लिए घास मिल जाती। पर ये स्थान खतरनाक भी माने जाते थे। लोगो का विश्वास था, वहाँ हिम मानव रहते हैं। वे उन्हें येती कहते थे। तेनजिंग ने भी येतियों के बारे में सुना था। लामा अक्सर उनकी कहानियाँ सुनाया करते थे। वे अन्य खतरनाक जीवों की भी कहानियाँ सुनाया करते। ये जीव दैत्यों से भी खतरनाक थे। येती से भी भयानक थे। तेनजिंग भी इन खतरनाक जीवों की कहानियाँ सुनते। पर वे स्वयं एक दिन इन जीवों को देखना चाहते थे। उन्हें मालूम था कि कई लोग चोमो–लुंगमा पर चढ़े हैं। इसमें उनके इलाके के भी लोग थे। उनमें कुछ मारे गए थे। पर कई जीवित भी लौट आए थे।

तेनजिंग बड़े हुए तो उन्हें सोलो–खुम्बू छोटा लगने लगा। वे सोचते, संसार कितना बड़ा है और सोलो–खुम्बू कितना छोटा। उनके मन में एक विचार आता- सोलो–खुम्बू से बाहर निकलना चाहिए। बाहर की दुनिया देखनी चाहिए! और एक

दिन वे काठमांडू के लिए चल पड़े। तब उनकी अवस्था थी- केवल तेरह वर्ष!

संघर्षों की सीप : सफलता के मोती

अयोध्याप्रसाद सिंह 'हरिऔघ' हिन्दी के एक सुप्रसिद्ध कवि। उनकी एक कविता है। शीर्षक है– 'एक बूंद'। इसका भावार्थ कुछ ऐसा है :

एक बूंद थी। वह बादलों का घर छोड़कर आकाश से निकल पड़ी। निकल तो पड़ी, पर सोचने लगी, मेरा क्या होगा?, कहाँ जाऊँगी, कहाँ गिरूंगी। खेत पर?, तपते रेगिस्तान में। बूंद घबरा गई। लेकिन एक घटना घटी। वह बूंद एक खुली सीप की गोद में जा गिरी। और फिर एक दिन मोती बन गई।

क्या अर्थ है, इस कविता का? यही कि घर छोड़ने में घबराना नहीं चाहिए। दुनिया का सामना करना चाहिए। संघर्षों की सीप हमें मोती बना देती है। सफलता के मोती। तेनजिंग नोरगे ने भी संघर्ष किया था। वे तेरह साल के थे। माता–पिता, बहन के लाड़ले। वे भी उन्हें बहुत चाहते थे। उन्हें कोई दु:ख नहीं पहुँचाना चाहते थे। पर वे बाहर की दुनिया भी देखना चाहते थे।

तेनजिंग किशोर थे। जानते थे, माता–पिता घर से बाहर जाने की अनुमति नहीं देंगे। सो, एक दिन वे चुपचाप घर से निकल पड़े। उन्हें पैदल ही यात्रा करनी थी। कोई बस या रेलगाड़ी तो थी नहीं। उनका कोई साथी भी नहीं था। पर जहाँ चाह, वहाँ राह। पहाड़ी रास्ता, चक्करदार, खतरनाक, कहीं नदी, कहीं नाले। पर तेनजिंग चल पड़े। काफी दूर तक वे अकेले चले। फिर उन्हें कुछ यात्री मिल गए। दो सप्ताह बाद वे काठमांडू में थे।

काठमांडू : नेपाल की राजधानी। सड़कों पर भीड़। तरह–तरह की पोशाकें पहने लोग। तेनजिंग अचरज से भर गए। उन्होंने इतनी भीड़, ऐसे लोग, पहले कभी नहीं देखे थे। वहाँ उनका कोई परिचित नहीं था। कहाँ ठहरते। लेकिन वे घबराये नहीं। उन्होंने एक बौद्ध मठ का पता लगाया। वहाँ अजनबी लोगों की सहायता की जाती थी। उनका ख्याल रखा जाता था। वे इसी बौद्ध मठ में ठहर गए।

दो सप्ताहों तक वे काठमांडू की सड़कों पर घूमते रहे। उन्होंने बाजार देखा, बड़े–बड़े मंदिर देखे, मठ देखे। पर वे अपने माता–पिता को भूले नहीं। हर दम सोचते रहते, कैसे होंगे वे? उन्हें घर की याद सताने लगी। एक दिन उनकी भेंट कुछ लोगों से हुई। वे सोलो–खम्बू के थे। घर वापस लौट रहे थे। तेनजिंग भी उनके साथ हो लिये। कुछ दिन बाद वे घर पहुँचे। उन्हें देखकर माता–पिता बेहद खुश हुए। उन्होंने उन्हें गले से लगा लिया। फिर डांटा–फटकारा भी – क्यों गए थे घर छोड़कर?

इसके बाद पाँच वर्ष तक तेनजिंग घर पर ही रहे। पर एक बात वे जानते थे। वे कभी सोलो–खुम्बू में नहीं रह सकते। जीवन में वे किसान नहीं बनेंगे। पशुओं को चराने का काम नहीं करेंगे। दिन सप्ताह में बदले। सप्ताह महीनों में। महीने वर्षों में। तेनजिंग भी बड़े होते गए।

अब वे अठारह वर्ष के थे। बड़े हो गए थे। बाहर की दुनिया में जा सकते थे। खतरों का सामना करने की ताकत पा गए थे। सो एक दिन तेनजिंग फिर घर से निकल पड़े।

फिर काठमांडू की ओर ? नहीं।

इस बार उनकी मंजिल थी, दार्जिलिंग।

माँ का स्नेह : एवरेस्ट का आकर्षण

दार्जिलिंग जहाँ चाय बागान थे, जहाँ शेरपा थे। कुली का काम करने वाले शेरपा। पर्वतों पर जाने वाले शेरपा।

दार्जिलिंग जाने का एक और कारण था। शायद प्रमुख कारण। उन्हें पता चला था कि पर्वतों पर एक अभियान दल जाने वाला है। तेनजिंग इसी अभियान दल में शामिल होना चाहते थे। पर दार्जिलिंग जाने में कई दिक्कतें थीं। सबसे बड़ी दिक्कत थी – माता-पिता की अनुमति की। तेनजिंग जानते थे। माता-पिता कभी नहीं जाने देंगे। फिर क्या किया जाए ? तेनजिंग उधेड़बुन में रहे। अंत में उन्होंने एक निर्णय कर लिया। वे माता-पिता से बिना पूछे निकल पड़ेंगे।

एक बार फिर वे अपने माता-पिता को बिना बताए निकल पड़े। इस कारण उन्हें दुःख भी था। माता-पिता उन्हें बेहद चाहते थे। वे भी उन्हें बेहद चाहते थे। माता-पिता सीधे-सादे थे। पवित्र जिंदगी बिताने वाले। खास कर उनकी माँ। वे बहुत दयालु थीं। उन्होंने जिंदगी भर सादगी की जिंदगी बिताई। उन्होंने कभी अच्छे कपड़े नहीं पहने। न कभी अच्छा भोजन किया। जब भी मौका मिलता, वे दोनों चीजें मठों के लामाओं को दे देतीं। भिक्षुणियों को भेंट कर देतीं। तेनजिंग अपनी माँ का बेहद आदर करते थे। वे कहते थे, "मेरी सफलता में मेरी माँ के विश्वास, उसकी भक्ति, उसके आशीर्वादों, उसकी प्रार्थनाओं का बहुत बड़ा योग रहा है।"

ऐसी माँ को छोड़ना कठिन था।

एक ओर माँ का स्नेह, दूसरी ओर एवरेस्ट का आकर्षण।

पर एवरेस्ट की जीत हुई। घर से निकलना इतना आसान नहीं था। उसके लिए तैयारी करनी थी, योजना बनानी थी। वह भी चुपचाप। गुप्त रीति से। गाँव छोड़ने वाले अकेले तेनजिंग नहीं थे। ऐसे बारह लोग थे। इनमें लड़के भी थे, लड़कियाँ भी थीं। ये सब एक महीने तक गुप्त बैठकें करते रहे। रास्ते के लिए भोजन तथा दूसरी जरूरत की चीज़ें जुटाते रहे। तेनजिंग अपने साथ केवल कंबल ला पाए। पैसे तो थे ही नहीं। औरों का भी उनके जैसा ही हाल था। फिर भी उनके मन में उत्साह था। एक दिन ये बारह लोग गाँव से निकल पड़े।

तेनजिंग का एक प्रसिद्ध शेरपा मित्र था। नाम था दावा थोंडूप। वह भी दार्जिलिंग नहीं गया था। पर उसके बारे में उसे काफी जानकारी थी। उसीने तेनजिंग को बताया था कि एवरेस्ट पर अभियान दल जाने वाला है। उसमें हम सब को काम जरूर मिल जाएगा, सो, सब के मन में आशा थी।

कहते हैं, चार बरतन पास रखे होंगे तो खड़खड़ाएंगे ही। इसी तरह चार लोग एकत्र होंगे तो वाद-विवाद होगा ही। तेनजिंग के दल के साथ भी यही हुआ। बारह लोग, बारह दिमाग। हर एक की अपनी ढफली, अपना राग। फिर कठिन रास्ता। कहीं चढ़ाई, कहीं ढलान, कहीं जंगलों से भरी घाटियाँ, कहीं हरहराती — दौड़ती नदियाँ।

कहते हैं, संकट में समझदार लोग संगठित हो जाते हैं। तेनजिंग के दल के लोग भी संगठित रहे। पर केवल एक सीमा तक। जहाँ तक खतरे रहे, रास्ता दुर्गम रहा, वे सब साथ रहे। भारत-नेपाल की सीमा पर पहुँचते ही गड़बड़ हो गई। किसी बात पर मन् मुटाव हो गया। दल के लोग तेनजिंग को अकेला छोड़ कर चल पड़े।

तेनजिंग परेशान हो उठे। नई जगह, पास में एक पैसा नहीं। क्या करें, कहाँ जाएँ? पता चला, पासमें एक कस्बा है।

नाम — सिमाना। तेनजिंग उसी की ओर चल पड़े। वहाँ एक धनी व्यक्ति रहता था। नाम था रिंगा नामा। भाग्य की बात। तेनजिंग की उसी से भेंट हो गई। तेनजिंग को अपनी भाषा ही आती थी। वे नेपाली तक नहीं जानते थे। पर रिंगा नामा को शेरपा बोली की थोड़ी बहुत जानकारी थी। उन्हें असहाय जानकर वह घर ले गया। उसके परिवार वाले भी भले लोग थे। दयालु प्रवृत्ति के। उन्होंने तेनजिंग के ठहरने का प्रबन्ध किया। उन्हें भोजन कराया। पहनने के लिए नेपाली कपड़े दिए। बदले में तेनजिंग उनका काम कर दिया करते। घर के कामकाज में हाथ बंटाते। जंगल से जलाऊ लकड़ी ले आते। जंगल में वे अकेले होते। उन्हें अपने माता-पिता की याद आती। अपनी हालत पर तरस आता। कभी-कभी वे पेड़ के नीचे बैठ कर रोने भी लगते।

उन्हीं दिनों उन्होंने एक बात जानी। सपनों में और वास्तविकता में बड़ा अन्तर होता है। वे एक नहीं होते। सिमाना की जिंदगी से तेनजिंग ऊब गए। उन्होंने एक दिन रिंगा नामा से कहा, "मैं दार्जिलिंग जाना चाहता हूँ।"

रिंगा नामा उदार दिल का था। बोला, "ठीक है। मैं व्यापार के सिलसिले में वहाँ जा रहा हूँ। तुमको भी ले चलूँगा।"

और, एक दिन तेनजिंग दार्जिलिंग के लिए चल पड़े। पर यह सफर कठिनाइयों से भरा नहीं था। तेनजिंग एक कार में यात्रा कर रहे थे। तेनजिंग ने जीवन में पहले कभी कार नहीं देखी थी। उस पर बैठना तो दूर रहा। कार को देखकर उन्हें बेहद अचरज हुआ। और बैठकर तो खुशी का ठिकाना नहीं रहा। पहाड़ी सड़क पर कार दौड़ने लगी। तेनजिंगका मन तरह-तरह की कल्पनाएं करने लगा। नये नये सपने देखने लगा। आखिर वे दार्जिलिंग पहुँच ही गए।

दार्जिलिंग: नए अवसर, नए आकर्षण

दार्जिलिंग यही तो मंजिल थी उनकी। यहाँ के लिए तो सोलो-खुम्बू से रवाना हुए थे। तेनजिंग को लगा, दार्जिलिंग काठमांडू जैसा बड़ा नहीं है। पर कई बातों में वह काठमांडू से बड़ा था। वहाँ तेनजिंग ने जिंदगी में पहली बार नई-नई चीज़ें देखीं – रेलगाड़ी, इंजिन और बहुत सारे चिलिंगान्गा यानी विदेशी।

रिंगा नामा तेनजिंग को बहुत चाहता था। जानता था कि नए शहर में यह युवक कहाँ रहेगा। वह उन्हें आलूबारी ले गया। आलूबारी दार्जिलिंग के पास एक गाँव है। वहाँ आलू की खेती होती है। आलूबारी में रिंगा नामा का चेचेरा भाई रहता था। उसका नाम पौरी था। रिंगा नामा ने उसी के घर तेनजिंग के ठहरने का इंतजाम कर दिया। पौरी उन्हें देखकर खुश हुआ। उसके पास पन्द्रह गाएं थीं। उसने तेनजिंग से कहा, "तुम इन गायों की देखभाल करो। घर के कामकाज में हाथ बटाओ। और आराम से यहाँ रहो।"

तेनजिंग पौरी के घर रहने लगे। वे गायों की देखभाल करते। घर के कामकाज में हाथ बंटाते। धीरे-धीरे उन्होंने नेपाली सीख ली। नेपाली के अलावा वहाँ की एक और बोली थी। उसका नाम था – मालमो। तेनजिंग ने उसे भी सीख लिया। यहीं तेनजिंग की भेंट एक घसियारे से हुई। उसका नाम था – मन बहादुर तमंग। वे मन बहादुर को अपना गुरु मानते थे। वह उनके साथ गायों के लिए घास काटता। उन्हें दुनियादारी की बातें समझाता।

पौरी तेनजिंग को दार्जिलिंग भी भेजा करता था। तब उनका काम था – वहाँ दूध बेचना। दार्जिलिंग जाने के लिए

तेनजिंग बहुत आतुर रहते।

क्यों?

वहाँ से उन्हें हिमालय की पूर्वी श्रेणियाँ दिखाई देतीं। अनेक छोटी-बड़ी चोटियाँ। इनमें एक पर्वत को देखकर उन्हें अच्छा लगता। यह पर्वत था कंचनजंगा। उसकी धूप में चमकती चोटी उन्हें जैसे हिम्मत बंधाती। उन्हें लगता, वे हिमालय से दूर नहीं हैं। हिमालय, जिसे वे बेहद प्यार करते हैं।

दार्जिलिंग में और भी आकर्षण थे। सुंदर-सुंदर निवास-स्थान। चहल-पहल से भरे चायघर, सिनेमाघर, महल, किलेनुमा होटल। दूध बेचने के साथ-साथ वे इन चीजों को भी देखा करते।

लेकिन दार्जिलिंग में इन सब से बड़ा एक और आकर्षण था।

विपरीत परिस्थितियाँ

सन् 1933 का वर्ष था।

एवरेस्ट पर फिर चढ़ाई की जाने वाली थी।

इंग्लैंड से पर्वतारोही आ पहुँचे थे। पूरे शहर में हलचल थी। दार्जिलिंग में एक क्लब था। नाम था प्लांटर्स क्लब। इसमें अभियान दल के नेता बैठा करते। उनका नाम था ह्यू रटलेज। उनसे मिलने कई लोग जाते। 'शेरपा' भी उनसे मिला करते। तेनजिंग सोचते मुझे भी 'साहिब' से मिलना चाहिए।

तब दूध बेचने की बात उनके दिमाग से बिलकुल निकल गई। वे हर समय सोचते रहते, मुझे जाना चाहिए। साहिब से मिलना चाहिए। पहले-पहल प्लांटर्स क्लब जाने में वे डरते थे। उन्होंने दावा थोंडूप से मदद लेनी चाही। दावा थोंडूप उनका दोस्त था। उसे साहिब ने नियुक्त कर लिया था। सो, उन्होंने दावा थोंडूप से बात की। कहा, 'मेरे बारे में साहिब से बात करो न।'

'नहीं, तुम अभी बहुत छोटे हो।' दावा थोंडूप ने कहा। तेनजिंग को अपनी आशाओं पर पानी फिरता नजर आया। उन्होंने एक और कोशिश की। उससे कहा, 'मैं किसी भी वयस्क आदमी की तरह ताकतवर हूँ।' पर दावा थोंडूप अपनी राय पर अड़ा रहा। तब तेनजिंग ने अन्य शेरपाओं से भी कहा, पर वे भी यही कहते रहे – 'तुम अभी छोटे हो। बहुत छोटे...'

इन सब बातों से तेनजिंग थोड़े निराश हुए। पर उन्होंने हार नहीं मानी। उन्होंने तय किया, वे खुद बात करेंगे। लेकिन तब परिस्थितियां ही विपरीत थीं। 'साहिब' लोगों ने उन्हें शेरपा

ही नहीं समझा। वे उन्हें नेपाली मान बैठे।

कारण?

तेनजिंग के बाल कटे हुए थे। जब वे सोलो-खुम्बू से आए थे, तो बाल चोटियों में गुंथे रहते थे। लोगों ने उनका मजाक करना शुरू कर दिया। कहने लगे, 'तुम लड़की हो।' तेनजिंग परेशान हो गए। उन्होंने सोचा, बाल छोटे करा लेने चाहिए। 'न रहेगा बांस न बजेगी बांसुरी'। सो उन्होंने बाल कटवा दिए। एक और गड़बड़ी हुई। तेनजिंग के कपड़े भी शेरपाओं जैसे न थे। रिंगा नामा ने उन्हें नेपाली वस्त्र दिए थे और वे उन्हें ही पहना करते थे। इन सब बातों से वे नेपाली समझे जाने लगे। एक बात और थी। तेनजिंग के पास किसी अभियान-दल का प्रमाण–पत्र भी नहीं था।

काम ढूंढ़ने के लिए निकले कई नवयुवकों के साथ ऐसा ही होता है। वे पूछते हैं, 'क्या तुमने पहले कहीं काम किया है?' उत्तर मिलता है, 'नहीं'। 'इस पर वे कहते हमें तो केवल अनुभव वाले लोग चाहिए।' एक अजीब बात है। बिना काम किए उसे करने का मौका मिले, अनुभव कहाँ से मिलेगा!

तेनजिंग के पास कोई अनुभव नहीं था। उन्हें काम नहीं मिला।

एक दिन अभियान दल दार्जिलिंग से रवाना हुआ। तेनजिंग बुझे मन से उसका प्रस्थान देखते रहे। उनका मन खिन्न हो गया। फिर उन्होंने स्वयं को संभाला। काम में मन लगाया। वे पौरी की गायों की देखभाल करते रहे। दूध बेचते रहे। यहीं उनका परिचय एक लड़की से हुआ। तेनजिंग और उसके बीच भाव-ताव को लेकर रोज तकरार हुआ करती। इस लड़की का नाम अंग लहमू था। बाद में तेनजिंग ने उसी से विवाह किया।

दिन बीत रहे थे। तेनजिंग को दार्जिलिंग में रहते हुए एक वर्ष हो चला था।

एक बार सोलो-खुम्बू की ओर

इसी बीच सोलो-खूम्बू से कुछ लोग दार्जिलिंग आए। उन्होंने तेनजिंग को देखा। उन्हें अचरज हुआ। सोलो-खुम्बू में तो खबर थी कि वे नहीं रहे। इन लोगों ने तेनजिंग को उनके माता-पिता के बारे में बताया। कहा कि वे लोग बहुत दु:खी हैं। उन्हें खबर मिली है कि तुम्हारी मृत्यु हो गई है।

तेनजिंग उदास हो गए। माता-पिता और घर की याद से वे बेचैन हो उठे। उन्होंने घर लौटने का, माता-पिता से मिलने का फैसला कर लिया।

तेनजिंग ने पौरी को अपनी इच्छा बताई। वह बोला, "ठीक है। जाओ। पर अपनी जगह कोई आदमी रख जाओ।"

अब तेनजिंग किसी आदमी की तलाश में शहर में निकले। माता-पिता से मिलना जरूरी था। किसी तरह उन्होंने एक आदमी खोजा। उसे अपनी जगह रखा और तत्काल निकल पड़े। उन्हें भय था कि कहीं उस आदमी का या पौरी का दिमाग बदल न जाए। फिर तो उनका जाना मुश्किल हो जाएगा।

एक बार फिर वही सफर शुरू हुआ। दार्जिलिंग से काठमांडू। वहाँ से सोलो-खुम्बू। वही पहाड़ी रास्ते। वही खतरनाक घाटियाँ। फिर एक दिन तेनजिंग अपने गाँव पहुँच ही गए।

यह क्या ?

तेनजिंग के माता-पिता उन्हें मृत समझ कर पूजा-पाठ कर रहे थे।

उन्होंने बेटे को देखा।

पहले तो आँखों पर विश्वास नहीं हुआ। फिर वे रोने लगे। इतने दिनों बाद बेटा घर वापस आया था। वह बेटा, जिसे उन्होंने मृत समझ लिया था। वे बहुत देर तक रोते रहे। आखिर उनकी

रुलाई थमी। अब वे खुश थे। बेटा मिल गया था। इस बार उन्होंने बेटे को डांटा-डपटा नहीं। वह अब बड़ा हो गया था।

तेनजिंग ने गाँव के हालचाल पूछे। अपना हाल बताया। उन्हें पता चला, सोलो-खुम्बू में भूचाल आया था। गाँव के कई घर गिरे थे। तेनजिंग के घर का भी एक हिस्सा ढह गया था। सबसे पहले उन्होंने उसे फिर से बनाने में मदद की। फिर घर के कामकाज में हाथ बंटाने लगे। खेती का काम। याकों की देखभाल।

गरमियाँ शुरू हो गईं थीं। यात्रा के लिए अच्छा मौसम था। एक दिन तेनजिंग के पिता ने उससे कहा, "बेटा, तिब्बत जाकर नमक ले आओ।"

सोलो-खुम्बू में नमक की हमेशा कमी रहती थी। उसे तिब्बत से लाया जाता था।

एक दिन तेनजिग तिब्बत के लिए चल पड़े।

तिब्बत की यात्रा आसान नहीं थी। वही पहाड़ी रास्ता। खतरनाक। उन्होंने नांगदा – ला नामक दर्रा पार किया। तिब्बत में ला का अर्थ दर्रा होता है। वे यात्रा करते हुए एवरेस्ट के दूसरी ओर पहुँचे। वहाँ रोंगबुक नामक एक स्थान है। वहाँ एक प्रसिद्ध बौद्ध मठ है। यह थ्यांगबोचे मठ से भी बहुत बड़ा है। उसमें तब पाँच सौ बौद्ध भिक्षु और भिक्षुणियाँ रहते थे।

रोंगबुक का एक और महत्व था। एवरेस्ट को जाने वाले अभियान दल वहीं अपना शिविर लगाया करते थे।

तेनजिंग तिब्बत पहुँचे। वहाँ से नमक लेकर घर लौटे। दिन इसी तरह बीतने लगे। शीघ्र ही तेनजिंग का मन ऊब गया। सोचने लगे, क्या करें, कहाँ जाएं। इसी बीच एक दिन पिता का आदेश मिला, तिब्बत जाकर फिर नमक लाओ।

तेनजिंग ने सोचा, क्या जिंदगी इसी तरह बीतेगी ? क्या उसे इसी तरह बितानी चाहिए। नहीं, बाहर की दुनिया में फिर जाना

चाहिए। उनकी नजर चोमो-लुंगमा पर पड़ी। चोमो-लुंगमा – विश्व की जननी – देवी। उस पर कोई पक्षी तक नहीं उड़ सकता।

उन्होंने सोचा, मुझे तो चोमो-लुंगमा तक पहुँचना है। और सोलो-खुम्बू में रहकर वहाँ जाना कठिन है। फिर? दार्जिलिंग चलना चाहिए। वहीं अवसर मिलेगा। और एक दिन तेनजिंग दार्जिलिंग के लिए चल पड़े। जाना था तिब्बत, पहुँच गये दार्जिलिंग।

शेरपाओं के बीच : शोक भी, गर्व भी

दार्जिलिंग में दो बस्तियां थीं – एक का नाम था – तूंग-सूंग बस्ती और दूसरी का नाम था भूटिया बस्ती। दार्जिलिंग पहुंचकर तेनजिंग तूंग-सूंग बस्ती में गए।

वहाँ एक अनुभवी शेरपा पर्वतारोही रहा करते थे। उनका नाम था – अंग नश्त्वे। तेनजिंग उन्हीं के घर किरायेदार के रूप में रहने लगे। दावा थोंडूप भी वहीं पास में रहते थे। वे तेनजिंग के मित्र थे। और भी शेरपा रहा करते थे। वे सब पर्वतारोही थे। एवरेस्ट अभियान में शामिल हो चुके थे। अन्य पर्वतों पर चढ़ भी चुके थे।

उन दिनों तूंग-सूंग बस्ती में विचित्र वातावरण था। शोक भी था। गर्व भी था।

शोक क्यों था?

हुआ यह था। एक जरमन अभियान दल नंगापर्वत गया था। यह पर्वत शिखर कश्मीर में है। इस दल में बस्ती के कई शेरपा गए थे। उनमें दावा थोंडूप और अंग त्सेरिंग नाम के शेरपा भी थे। इस अभियान के समय एक दुर्घटना घट गई। भयंकर दुर्घटना। चढ़ाई के समय एक भीषण अंधड़ आया। उसमें

चार जरमन पर्वतारोही मारे गए। छह शेरपाओं के भी प्राण गए। इसीलिए बस्ती में शोक था।

पर गर्व क्यों?

गर्व का भी कारण था। पहली बार शेरपा अपने घर से इतनी दूर गए थे। यह साहस की बात थी।

दावा थोंडूप और अंग त्सेरिंग इस अभियान के संस्मरण सुनाया करते। वे तेनजिंग को एक साहसी शेरपा के बारे में बताते। इस शेरपा का नाम ग्याली था।

ग्याली, दल के नेता के साथ शिखर तक पहुँचा था। दल के नेता का नाम विली मर्कल था। वे दोनों शिखर तक तो पहुँच गए। पर लौटते वक्त विपत्ति आ गई। मर्कल बेहद कमजोर हो गए थे। एक कदम भी नहीं चल सकते थे।

ग्याली ठीक था। वह चाहता तो अकेले वापस लौट सकता था। पर क्या वह वापस लौटा? नहीं। अपने नेता को असहाय छोड़ना उसे ठीक न लगा। उसने भरसक कोशिश की। चाहा, किसी तरह उन्हें सुरक्षित स्थान तक ले जाए। पर मर्कल बेहद थक गए थे। उनमें ताकत नहीं रही थी। और उनके प्राण वहीं छूट गये। ग्याली भी नहीं लौट पाया।

ग्याली की कहानी रोमांचक थी। साहस से भरी, कर्तव्य-निष्ठा की प्रेरक गाथा। तेनजिंग ग्याली के बलिदान की कहानी सुनते। उन्हें गर्व होता कि वे भी शेरपा हैं। वे उपयुक्त अवसर की प्रतीक्षा करने लगे।

सोलो-खुम्बू की तरह दार्जिलिंग में भी भूकम्प आया था। कई घर ढह गए थे। उनकी मरम्मत का काम जारी था। दार्जिलिंग में सेंट पाल स्कूल है। उसकी भी इमारत ढह गई थी। उसकी भी मरम्मत की जा रही थी। कई शेरपा वहाँ मजदूरी करते। तेनजिंग भी वहाँ मजदूरी करने लगे। तब उन्हें प्रतिदिन बारह आने मिलते। यही मजदूरी थी।

तेनजिंग बताते...

"आज यह मजदूरी बहुत कम प्रतीत होती है। पर उन दिनों वह अच्छी खासी मजदूरी समझी जाती थी। शेरपा जब पहाड़ों पर नहीं जाते तो मजदूरी ही करते। उन दिनों थोड़े से दुकानदार और व्यापारी ही अमीर थे। शेष हम सब शेरपा बेहद गरीब थे। हम सब लकड़ी के खोखों में रहते। उनकी छत टीन की होती। अक्सर सारा परिवार एक ही खोखे में रहता। चावल और आलू -- यही हमारा मुख्य भोजन था। हम सब काफी काम करते थे। फिर भी हमारी आय बहुत कम थी। पर ईश्वर ने हमें एक वरदान भी दिया था। हमारी जरूरतें बहुत थोड़ी थीं। हम कम में ही गुजारा कर लेते थे। हमें कोई शिकायत नहीं थी। हम संतोषी जीव थे।"

तेनजिंग काफी बड़े हो गए थे। दोस्तों ने सलाह दी -- 'शादी कर लो।'

तेनजिंग भी अकेले रहते तंग आ गए थे। उन्होंने हामी भर दी। संयोग की बात। बस्ती में सोलो-खुम्बू की एक लड़की रहती थी। उसका नाम था -- दावा फुटी। 'फुटी' का अर्थ है -- संतानों को जन्म देने वाली पत्नी।

एक दिन दावा फुटी से तेनजिंग का विवाह हो गया। उन्होंने उसे सोलो-खुम्बू में भी देखा था। पर दार्जिलिंग में ही उसे जान पाए। अब तेनजिंग परिवार वाले हो गए थे। उन्होंने तूंग-सूंग बस्ती में ही एक घर किराये पर ले लिया। पत्नी के साथ उसी में रहने लगे।

धैर्य से प्रतीक्षा

तेनजिंग मजदूरी करते। जो भी आय होती, उससे घर चलाते। पर वे चोमो-लुंगमा को भी नहीं भूले थे। उन्हें

उपयुक्त अवसर की प्रतीक्षा थी। वे अधीर नहीं हुए थे। धैर्य उनका मूल मन्त्र था। धैर्य। धीरज!! धैर्य का बड़ा महत्व है जीवन में। कवियों ने धीरज के बड़े गुण गाये हैं।

एक लोककवि की उक्ति है –

''धीरज धरहु तो उतरौ पारा'।

अर्थात् धीरज रखोगे तो पार उतर जाओगे।

एक और कहावत है–

''धीरज का फल मीठा होता है।'' सो, तेनजिंग ने भी धीरज नहीं छोड़ा। उन्हें विश्वास था – 'एक दिन अवसर अवश्य मिलेगा।' तेनजिंग को एक दिन अवसर मिला ही।

आखिर अवसर मिल ही गया

सन् 1935 की बात है। दार्जिलिंग में एक खबर जोरों पर थी। एक अभियान दल पहाड़ों पर जाने वाला था। उसके नेता थे — एरिक शिप्टन। इस दल का उद्देश्य शिखर पर चढ़ाई करना नहीं था। उसका लक्ष्य था — खोज करना। उसके कई लाभ थे। पर्वतारोहियों को आशा थी, शायद एवरेस्ट के लिए कोई नया रास्ता मिल जाए। वे इस बार तिब्बत की ओर से जाना चाहते थे। वहां नार्थ कोल नाम की जगह है। उन्हें उम्मीद थी, शायद वहीं से रास्ता मिल जाए।

यों भी, इस वर्ष शिखर पर चढ़ना खतरे से खाली नहीं था। चढ़ाई के दौरान मानसून आ जाता। अंधड़ चलते। वर्षा होती। बर्फ धंसती। तरह-तरह की विपत्तियाँ आ जातीं। शायद कुछ लोगों के प्राण भी चले जाते। इसीलिए दल का लक्ष्य था — खोज।

अभियान दल के नेता शिप्टन योग्य शेरपाओं की तलाश में थे। दार्जिलिंग में एक हिमालयन क्लब भी था। उसके सेक्रेटरी थे डब्लू जे. किड। वे भी शिप्टन की मदद कर रहे थे। वे अनुभवी शेरपा चाहते थे और उनकी कोई कमी नहीं थी। ये सब एक शेरपा सरदार की सिफारिश पर चुने गए थे। सरदार का नाम था करमा पाल। वह एक व्यापारी भी था। पर तेनजिंग का उससे कोई परिचय न था। तेनजिंग के पास पूर्व अनुभव का प्रमाण-पत्र भी नहीं था। वे नहीं चुने गए। थोड़ी देर के लिए उन्हें निराशा ने घेर लिया। अब क्या हो?

तभी पता चला, दो लोगों की और जरूरत है।

जगह दो लोगों की। उम्मीदवार पहुँचे बीस।

तेनजिंग भी वहीं खाकी बुश जैकेट और पैंट पहन कर लाइन में खड़े हो गए। उनका खयाल था, उस वेशभूषा में वे अनुभवी शेरपा लगेंगे।

शिप्टन और किड ने एक-एक उम्मीदवार की जांच-पड़ताल की। तेनजिंग की बारी आई। उनकी भी जांच-पड़ताल की गई। अनुभव का प्रमाण-पत्र मांगा गया। वह तो उनके पास था ही नहीं। एक और दिक्कत थी। तेनजिंग को तब अंगरेजी भी नहीं आती थी। वे तर्क करना चाहते थे। अपनी बात बताने की कोशिश कर रहे थे। वे कहना चाहते थे। नए लोगों को काम नहीं मिलेगा, तो अनुभव कैसे मिलेगा।

वे चुप थे, भाषा ही नहीं आती थी। पर उन्होंने हार नहीं मानी। इशारे से अपनी बात समझा दी। शिप्टन और किड ने आपस में बात की। फिर तेनजिंग को लाइन से बाहर आने के लिए कहा। तेनजिंग निराश हो गए। उन्हें लगा, उन्हें चुना नहीं गया है।

हारे थके वे जाने लगे। तभी किड ने उन्हें बुलाया। इशारे से बताया, उन्हें चुन लिया गया है।

तेनजिंग की प्रसन्नता का ठिकाना नहीं रहा। पर दूसरे शेरपा नाराज हो गए। यह क्या? एक नए शेरपा को चुना गया। उसे तो कोई अनुभव भी नहीं है, पर तेनजिंग ने उनकी नाराजी का बुरा नहीं माना। उनके शब्दों में – "मैं बहुत खुश था। इतना कि वे सब मिल कर पीटते भी तो मैं बुरा नहीं मानता।"

अभियान दल की मजदूरी तय थी। बारह आना प्रतिदिन। बरफीले प्रदेश में चार आने और बढ़ाये जाने वाले थे। तेनजिंग को लगा, अच्छा काम कर वे ज्यादा पैसा कमा सकेंगे। यह जरूरी था। पर महत्वपूर्ण नहीं। महत्वपूर्ण बात और थी। उनका सपना

पूरा होने जा रहा था। वे पर्वतारोही बनने जा रहे थे।

तेनजिंग ने पत्नी से विदा ली।

एवरेस्ट के लिए नए रास्ते की खोज

एक दिन अभियान दल रवाना हो गया। उसकी दिशा सिक्किम की ओर थी। पहाड़ी रास्ता। कभी चढ़ाई, कभी उतराई। गहरी घाटियाँ। ऊँचे दर्रे। तीन सौ मील का सफर कर वे सब तिब्बत में पहुँचे। पर इस रास्ते में एक लाभ था। सारा सामान खच्चरों पर ले जाया जा सकता था।

अभियान दल धीरे–धीरे सफर करता रहा। एक दिन वे रोंगबुक पहुँचे। पर वे वहां से एवरेस्ट की ओर नहीं गए। उसके आसपास की कई चोटियों पर चढ़े। दर्रे पार किए। उन्हें एवरेस्ट के लिए अच्छे मार्ग की तलाश थी। पर नार्थ कोल से बढ़िया रास्ता कोई मिला ही नहीं। अन्त में वे पूर्वी रोंगबुक ग्लेशियर की ओर बढ़े।

वहाँ अभियान दल ने शिविर लगाए।

पहाड़ों में खबर तेजी से फैलती है। इसका एक कारण है। अभियान दल में शेरपा होते हैं। शेरपा उन्हीं पहाड़ों के होते हैं। उनके परिवार के लोग दार्जिलिंग तो आ नहीं सकते। वे प्रतीक्षा करते रहते हैं। कब कोई अभियान दल आए। बिछुड़े लोगों से मिलना हो। ये लोगों से पूछते रहते हैं।

इस अभियान दल की खबर भी तेजी से फैली। तेनजिंग के पिता को भी मालूम पड़ा। वे बेटे से मिलने शिविर में आए। इसके लिए उन्हें काफी यात्रा करनी पड़ी। वे सोलो-खुम्बू से नांग पा ला गए। वहाँ से शिविर तक पहुँचे।

पिता से मिल कर तेनजिंग बहुत खुश हुए। उन्होंने पिता को बताया, 'हम चोमो–लुंगमा की ओर जाएँगे।'

एक दिन अभियान दल के लोग ग्लेशियर पहुँच गए। वहाँ कोई जीवन नहीं था। उनके ठीक सामने, ठीक ऊपर आकाश में भी दो–तीन मील ऊँची चट्टानें। और बर्फ की मीनार थी। तेनजिंग को घर की याद हो आई। सोचा, कितनी अजीब बात है। उनका घर यहाँ से कुछ मील दूर ही है। इसी पर्वत की छाया में उनका बचपन बीता है। यहीं उन्होंने अपने पिता के याकों की देखभाल की है। पर पर्वत इस ओर से बिलकुल अलग लग रहा था। उसे पहचान पाना कठिन था। पर लोगों का कहना था, 'यही चोमो–लुंगमा है।' वे भी यह जानते थे कि चोमो-लुंगमा के सिवाय और कोई पर्वत इतना ऊँचा नहीं हो सकता।

शिविर में काम काफी कठिन था। एक शेरपा को नब्बे पौंड वजन का सामान ले जाना पड़ता था। पर तेनजिंग के मन में उत्साह था। उन्हें बोझ फूल जैसा हलका लग रहा था। वे सोचते थे, 'मुझे अपने सपने को पूरा करने का अवसर मिल रहा है।'

इस अभियान में तेनजिंग ने कई नई बातें सीखीं। उन्हें कई नई चीज़ों की जानकारी हुई। पर अभी बहुत कुछ सीखना था। पर्वतारोहण की तकनीक समझनी थी। रस्सी का उपयोग, कुल्हाड़ी से बर्फ पर सीढ़ियाँ बनाना, शिविर खड़ा करना। उसे खोलना। अच्छे रास्ते ढूंढना।

तेनजिंग नए शेरपा थे। इसलिए उन्हें ज्यादा काम नहीं दिया गया। पर वे अपने मन से सारा काम करते। अभियान दल के सदस्य भी उनसे खुश थे। अभियान दल 22 हजार फुट के आगे नार्थ कोल तक गया। शेरपाओं ने वहाँ तक सामान पहुँचाया। उनमें तेनजिंग भी थे। फिर एक दिन अभियान दल वापस लौट पड़ा। सभी शेरपा खुश थे। घर लौटने की खुशी किसे नहीं होती। पर तेनजिंग निराश थे। वे पर्वत पर और ऊपर जाना चाहते थे। बाद में भी उनके मन में यही भावना रही। जब भी वे ऐवरेस्ट की ओर गए, यही मन हुआ, ऊपर और ऊपर जाएं। पर

उस बार वे ज्यादा कुछ नहीं कर सकते थे। उन सबको वापस लौटना ही था। पर उन्होंने स्वयं से कहा, 'अरे, अभी तो तुम केवल इक्कीस बरस के हो। और भी अभियान होंगे। शीघ्र बहुत शीघ्र तुम भी एक सच्चे 'टाइगर' बनोगे।'

एक और अभियान

शिप्टन का दल लौट आया था। उसका तेनजिंग के लिए बेहद महत्व था। अब वे अनुभवहीन नहीं थे। अब उनके पास भी प्रमाण–पत्र था–पर्वतारोहण का। अब उन्हें कोई कठिनाई न होगी किसी अभियान में शामिल होने के लिए।

तेनजिंग दार्जिलिंग में ही रहा करते थे। उन्हें एक पुत्र भी हुआ। उन्होंने उसका नाम रखा–नीमा दोरजे। वह बेहद सुन्दर था। लेकिन वह चार वर्ष की उम्र में नहीं रहा। तेनजिंग को तथा उनकी पत्नी दावाफुटी को बेहद दु:ख हुआ। पर मृत्यु पर किसका बस।

सन् 1935 – पतझड़ का मौसम। एक और अभियान। पर यह एवरेस्ट के लिए नहीं था।

सिक्किम में एक पर्वत है– काबरू। यह 24 हजार फुट ऊँचा है। कंचनजंगा हिमालय की प्रसिद्ध चोटी है। काबरू इसी चोटी के पास है। यह अभियान–दल विशेष बड़ा न था। पर्वतरोहियों में डाक-तार विभाग के एक इंजीनियर थे। नाम था कुक। उनके एक जरमन मित्र भी थे। शेरपा थे– तेनजिंग, अंग त्सेरिंग, पासांग फुटर और पासांग कि कुती। इनमें तेनजिंग उम्र में सबसे छोटे थे। इसलिए उन्हें सबसे अधिक बोझ उठाना पड़ता था। इस अभियान दल में कोई विशेष घटना नहीं हुई।

सरदियों में शेरपा आराम करते हैं। सरदियों में पर्वतोरोहण नहीं होता। चारों ओर बर्फ ही बर्फ। तापमान भी बहुत कम होता है। तेनजिंग ने भी सरदियों में आराम किया।

पतझड़ गया। पतझड़ के जाते ही वसंत आ गया। पर्वतों पर फिर अभियान होने लगे। तेनजिंग भी दो अभियानों में शामिल हुए। इनमें से एक एवरेस्ट के लिए था।-

एवरेस्ट यानी चोमो-लुंगमा।

अब तेनजिंग आसानी से अभियान—दल में शामिल हो सकते थे। एक और बात थी। इस अभियान दल में एरिक शिप्टन भी थे। उनके साथ तेनजिंग काम कर चुके थे। इनके अलावा और भी कई पर्वतारोही थे। वे सभी प्रसिद्ध थे। यह दल बहुत बड़ा भी था। उसके पास कई नए उपकरण भी थे। सबको उम्मीद थी, शायद इस बार वे सफल हो जाएं। एवरेस्ट तक पहुँच सकें।

पर परिस्थितियाँ विपरीत हो गईं। मौसम बेहद खराब हो गया था। अचानक बरसात शुरू हो गई। लगता था, जैसे मानसून आ गया है। पर्वतारोहियों ने ग्लेशियरों पर किसी तरह तीन शिविर लगाए। इस समय बर्फ भी लगातार पड़ने लगी। वे किसी तरह नार्थ कोल तक पहुँचे। वहाँ ढलान बेहद सपाट थी। उन्होंने उस पर चढ़ना शुरू किया। पर यह क्या? वे अचानक बर्फ में धंसते चले गए। कहीं—कहीं छाती तक बर्फ थी। यह कमरतोड़ काम था। खतरे भी कम नहीं थे। बर्फ ने सारी चीजों को ढंक लिया था। पहाड़ों में बड़ी—बड़ी खाइयाँ होती हैं, दरारें होती हैं। बर्फ ने सबको छिपा दिया था। पता ही नहीं चलता था, कहाँ क्या है। पर्वतारोही किसी भी क्षण इन खाइयों में गिर सकते थे। एक और भय था। बर्फ—स्खलन का भय। उन्हें सन् 1922 की घटना याद थी। बर्फ धंसने के कारण कई शेरपा मारे गए थे।

फिर भी किसी तरह कुछ लोग नार्थ कोल तक पहुँचे। तेनजिंग भी थे। वहाँ भी मौसम बेहद खराब था। बर्फ लगातार गिर रही थी। इतनी बर्फ कि एक दूसरे को देखना कठिन। किसी तरह बर्फ थमी। लोगों ने चैन की सांस ली। पर एक दूसरी मुसीबत आ गई। तेज हवाएँ चलने लगीं। फिर तो कभी बर्फ

गिरती, कभी तेज हवा चलती। लगता, पर्वतारोहियों को उड़ाकर नीचे ले जाएगी। संकट में ही साहस की परीक्षा होती है। कुछ लोग अभी भी आगे जाने के लिए तैयार थे।

लेकिन दल के नेता समझदार थे। वे बोले, 'नहीं', मौसम बेहद खतरनाक है। हम कोई दुर्घटना नहीं चाहते। कोई जनहानि का खतरा नहीं उठाना चाहते। एवरेस्ट कहीं भागा नहीं जाता। हम अगले वर्ष फिर आएंगे। तब तक एवरेस्ट यहीं बना रहेगा।

बात भी सही थी। एवरेस्ट तो सदियों से वहाँ था। आगे भी बना रहेगा। अतः अभियान–दल लौट पड़ा। लौटना भी आसान नहीं था। उसमें भी कई खतरे थे।

ऐसा ही एक खतरा गाडोंग पामा नामक एक स्थान में था। वहाँ एक नदी थी। पहाड़ी नदी, तेज बहाव। कोई पक्का पुल नहीं। उसे पार करने के लिए एक रस्सी बंधी थी। उसी के सहारे नदी पार करनी थी। एक–एक कर सभी पार हो गए। उन्होंने नदी पार करने में एक जाल की सहायता भी ली। एक शेरपा ज्यादा साहसी था। साहसी नहीं, दुस्साहसी। बोला, "मैं बिना जाल के नदी पार करूंगा।" लोगों ने उसे मना किया, पर वह नहीं माना। और इसका फल उसे भुगतना पड़ा। वह नदी में आधी दूर तक पहुँच गया। वहाँ धार तेज थी। संभल न पाया। धार में फंस गया। उसके हाथ से रस्सी छूट गई। और! और वही हुआ, जिसका भय था। वह धार में बह गया। कुछ लोगों ने नदी में कूद कर उसे बचाना चाहा। पर बहाव तेज था। वे उसे बचा नहीं पाए।

आखिर एक दुर्घटना हो ही गई। लोग उदास हो गए। पर यात्रा तो करनी ही थी। एक दिन वे सब दार्जिलिंग लौट आए।

गढ़वाल की ओर

तेनजिंग का मन बेचैन था। वे खाली नहीं बैठना चाहते थे।

शीघ्र ही उन्हें एक अवसर मिल गया। एरिक शिप्टन ने मध्य हिमालय में जाने का निश्चय किया। उन्होंने तेनजिंग को भी चलने के लिए कहा। वे तो इसी की प्रतीक्षा में थे। फौरन तैयार हो गए। खाली बैठने से कुछ न कुछ करना बेहतर है। इस अभियान में तेनजिंग ने कई नई चीजें देखीं। वे पहली बार ट्रेन में चढ़े। पहली बार उन्होंने बड़े–बड़े शहर देखे। कलकत्ता, दिल्ली और दूसरे शहर। यात्रा में हमेशा नए–नए लोगों से परिचय होता है।

शिप्टन ने तेनजिंग का परिचय कई लोगों से कराया। इनमें एक थे ओस मास्ट्राम। वे 'रायल इंजीनियर्स कोर' में मेजर थे। वे गढ़वाल में सर्वेक्षण कर रहे थे। उन्होंने तेनजिंग से साथ चलने को कहा। वे तत्काल तैयार हो गए। उसी वर्ष नंदादेवी शिखर पर चढ़ाई की गई थी। वह चोटी 25,660 फुट ऊँची है। पहली बार मनुष्य इतनी ऊँचाई पर चढ़ा था। लोगों में खुशी थी। ओस मास्ट्राम भी नंदादेवी की ओर जा रहे थे। उन्हें उसके आस-पास के क्षेत्रों का सर्वेक्षण करना था।

इसी बीच तेनजिंग बीमार पड़ गए। वहाँ कभी तेज गरमी पड़ती। कभी बरसात होती। एवरेस्ट यात्रा के कारण वे कुछ कमजोर भी हो गए थे। बेहद थके हुए भी थे। उन्हें बुखार ने दबोच लिया। मेजर ओस मास्ट्राम भले व्यक्ति थे। दल के और भी व्यक्ति भले थे। मेजर ओस मास्ट्राम कभी तेनजिंग को अपनी पीठ पर लादते। कभी कोई अन्य सदस्य उन्हें उठाता।

मेजर ओस मास्ट्राम को जड़ी–बूटियों का भी ज्ञान था। उन्होंने तेनजिंग को बताया, "पित्त की खराबी के कारण तुम्हें बुखार आया है। यहाँ चट्टानों पर एक काई होती है। उसे गरम पानी में पियो। ठीक हो जाओगे।" तेनजिंग ने यही किया। गरम पानी में काई पीते ही उन्हें उलटियाँ शुरू हो गईं। वे और कमजोर हो गए। पर एक बात जरूर हुई। उनका बुखार जाता रहा। वे शीघ्र ही ठीक हो गए।

सर्वेक्षण का काम समाप्त हुआ। तेनजिंग फिर दार्जिलिंग लौट आए। दार्जिलिंग के आस–पास कई दर्शनीय स्थल है। पर्वत–शिखर हैं। सैर करने दूर–दूर से यात्री आते हैं। शेरपा उनकी सहायता करते हैं। शहर के पास एक पहाड़ है। नाम है- टाइगर हिल। आकाश साफ हो, मौसम अच्छा हो तो यहाँ से एवरेस्ट दिखाई देता है। उत्तर में दो शिखर हैं। ये हैं- संदकपू और फालुट। वहाँ से एवरेस्ट और भी अच्छी तरह दिखता है। तेनजिंग भी वहाँ तक जाते थे। एवरेस्ट को देखते थे। उन्हें संतोष होता। एवरेस्ट अभी है। पर उन्हें दुःख भी होता, कारण, वे वहाँ जा नहीं सकते थे। केवल उसे देख सकते थे। पर प्रतीक्षा में भी आनंद होता है। उन्हें विश्वास था, एक न एक दिन वे जरूर वहाँ पहुँचेंगे।

सन् 1937। इस वर्ष एवरेस्ट के लिए कोई अभियान दल नहीं जा रहा था। अतः तेनजिंग फिर गढ़वाल चले गए। वहाँ उन्हें दो शिक्षकों के साथ पर्वतारोहण करना था। बेकार बैठने से तो यह अच्छा था। इस अभियान में तेनजिंग को तरह–तरह के अनुभव हुए। उनके साहस की भी परीक्षा हुई।

एक दिन वे और उनके साथी बिछड़ गए। घना कोहरा। फिर बरसात शुरू हो गई। तेनजिंग के साथ मार्टिन थे। वे एक शिक्षक थे। उन दोनों के पास न तम्बू था, न भोजन। वे साथियों को पुकारते रहे। पर कौन सुनता। वे कुहासे में, बरसात में भटकते रहे। अंत में उन्हें एक गुफा दिखाई दी। उन्होंने वहाँ दो दिन बिताए। आखिर मौसम साफ हुआ और वे शिविर तक लौटे।

बाद में उन्होंने तिब्बत के एक ओर यात्रा की। यह यात्रा लम्बी थी। यात्रा सफल रही। पर लौटते वक्त राह भूल गए। घने जंगल। जरा–सी गलती, बड़ा–सा कष्ट। उनके पास भोजन की भी कमी हो गई। उधर भूख लग रही थी। तभी एक दिलचस्प घटना घट गई।

हुआ यह कि उधर कुछ गाँव वाले आ निकले। वे दोपहर का भोजन करने रुके थे। तेनजिंग और उनके साथियों ने उनसे भोजन मांगा। कहा, "पैसे ले लो"। पर गाँव वाले न माने।

तेनजिंग को एक उपाय सूझा। वे जानते थे। गाँव वाले छूआछूत मानते हैं। अजनबी का छुआ भोजन नहीं खाते। उन्होंने श्री गिब्सन को यह बताया। फिर कहा, 'वे बारी–बारी से चीजें छुएं। पूछें कि 'यह क्या है?' 'वह क्या है?' श्री गिब्सन ने यही किया। गाँव वाले बेहद नाराज हुए। श्री गिब्सन ने उन्हें पैसे देने चाहे। पर उन्होंने पैसे नहीं लिए। बोले, 'हम ग्राम–प्रधान से शिकायत करेंगे।' और वे गाँव की ओर दौड़ गए। इधर दल अपनी राह चल पड़ा।

इस यात्रा में तेनजिंग बनी दर्रे तक पहुँचे। बनी दर्रा काफी ऊँचाई पर है। वे बद्रीनाथ भी गए। उसके बाद वे दार्जिलिंग लौट आए।

एक यात्रा जानी-पहचानी

सन् 1938 का वसंत। पर्वतारोहण के लिए अच्छा समय। एवरेस्ट के लिए एक और अभियान। उसके नेता थे टिल मैन– एक प्रसिद्ध पर्वतारोही। यह छोटा–सा दल था। उसमें शेरपा भी थे। तेनजिंग भी थे। यात्रा जानी–पहचानी थी। अप्रैल में वे रोंगबुक मठ के पार आधार शिविर तक पहुँच गए। आधार शिविर: इसे बेस कैंप भी कहते हैं। यहीं से असली अभियान शुरू होता है। एवरेस्ट के लिए आसान मार्ग की खोज की जाने लगी। टिल मैन ने तेनजिंग को साथ लिया। दो शेरपा और थे। वे ल्होता के दर्रे तक गए।

तेनजिंग बेहद खुश थे। वे एवरेस्ट के दोनों बाजुओं को देख सकते थे। वहाँ से उन्हें थामे का अपना पुराना घर भी दिखाई पड़ता था। नीचे खुम्बू ग्लेशियर था। वहाँ याक चर रहे थे। कैप्टेन मेलोरी इसी ल्होता दर्रे तक आए थे। टिल मैन और अन्य शेरपाओं ने दर्रे को पार किया। टिल मैन को एक आशा थी। शायद वहाँ से अच्छा मार्ग मिल जाए। पर वहाँ सपाट ढ़लान थी। चारों ओर बर्फ ही बर्फ। उतरना आसान था, पर चढ़ना कठिन। प्राय: असंभव। दर्रे पर घना कुहरा था। बादल भी थे। खुम्बू के पार एक बर्फीला कछार था। मेलोरी ने उसको एक नाम दिया था। यह एक वेलश नाम था- 'वेस्टर्न क्वम'।

वहाँ कोई ठीक रास्ता नहीं मिला। दल के लोग आधार शिविर लौट आए। फिर वे नार्थ कोल के लिए रवाना हुए। यहीं एक दुर्घटना होते-होते बची।

कोल के नीचे बर्फ धंसने का खतरा हमेशा बना रहता है।

यहाँ तेनजिंग पहली बार उसकी चपेट में आए। दो रस्सियों के सहारे छह लोग चढ़ाई चढ़ रहे थे। ये थे कैप्टेन ओलिवर, तेनजिंग और शेरपा बांगड़ी नोबरू। ये तीनों एक रस्सी पर थे। दूसरी रस्सी पर थे- टिल मैन तथा दो दूसरे शेरपा। बर्फ की ढलान सपाट थी। वह छाती तक गहरी भी थी। वे धीरे–धीरे कठिनाई से बढ़ रहे थे। सहसा चारों ओर से बर्फ तड़कने की आवाजें आईं। बर्फ धसकने लगी। अगले पल वे भी उसके साथ नीचे खिसकने लगे। तेनजिंग के पैर उखड़ गए। वे ढुलकने लगे। उनका सिर बर्फ में जा धंसा। चारों ओर अंधेरा ही अंधेरा। सन् 1922 में यही दुर्घटना घटी थी। तेनजिंग को उसकी याद थी। उन्होंने सोचा, दोबारा वैसी ही दुर्घटना घट रही है। उनका अंत आ पहुँचा है। पर उन्होंने हिम्मत नहीं हारी। वे अपने कंधे के ऊपर बार–बार बर्फ में कुल्हाड़ी चलाने लगे। उनकी कोशिश थी कि कोई सहारा मिल जाए। लुढ़कने से वे बच जाएं। उनकी कोशिश सफल ही हुई। उनकी कुल्हाड़ी एक ठोस बर्फ में धंस गई। वे उसके सहारे ऊपर चढ़े।

पर्वतारोहण के दौरान ऐसी घटनाएँ घटती ही रहती हैं। उस समय साहस से काम लेना पड़ता है। बुद्धि लड़ानी पड़ती है। निराशा से काम नहीं चलता। जीवन में यही बात है। निराशा हमें असफलता के गर्त में और धकेलती है। आशा की डोर हमें ऊपर ले जाती है। सफल बनाती है। तेनजिंग ने भी आशा की डोर नहीं छोड़ी थी। अंततः वे सफल हुए।

टाइगर का पदक

एक दिन किसी तरह वे सब नार्थ कोल पहुँचे। वहाँ उन्होंने तीसरा शिविर लगाया। तेनजिंग तीसरी बार यहाँ तक पहुँचे थे। पर इस बार उन्हें और ऊपर जाना था। वे अन्य शेरपाओं के साथ

आगे बढ़े। चौथा शिविर भी बनाया, फिर पाँचवाँ शिविर भी। चट्टानों पर बर्फ ही बर्फ। पर्वतारोही निराश हो गए। उन्होंने शिविर तक पहुँचने की आशा छोड़ दी। पर क्षण भर बाद उनकी निराशा टूटी। वे सब छठवाँ शिविर बनाने की तैयारी करने लगे। पर एक समस्या थी। शेरपा शिविर का सामान लेकर नहीं पहुँचे थे। अब क्या हो? साथ के शेरपाओं की हिम्मत टूट गई थी। वे बोले, 'हम सामान लेने नहीं जाएँगे। जाएँगे तो फिर वापस नहीं आएँगे।'

बड़ी समस्या आ गई। यात्रा रुक गई।

तेनजिंग हारने वाले व्यक्ति नहीं थे। वे बोले, 'अच्छा, मैं जाता हूँ। सामान लेकर आता हूँ।

वे अकेले नीचे गए। देखा, शेरपा सामान छोड़कर चले गए हैं। तेनजिंग क्या करते। अकेले पीठ पर सामान लादा। फिर चल पड़े। पर यात्रा आसान न थी। एक तो जगह–जगह फिसलन। दूसरे, पीठ पर सामान। एक बार तो वे बुरी तरह फिसले। पर उन्होंने कुल्हाड़ी के सहारे स्वयं को संभाल लिया। वे बच गए। नहीं संभलते तो? नीचे, एक मील गहरे रोंगबुक ग्लेशियर में जा गिरते।

अंधेरा भी छाने लगा था। यह और बड़ी मुसीबत थी। पर तेनजिंग जीवट के आदमी थे। वे किसी तरह पाँचवें शिविर तक पहुँच ही गए। उनकी बड़ी प्रशंसा की गई। बीस रुपये का पुरस्कार दिया गया। सब ने रात वहीं बिताई। अगले दिन फिर चढ़ाई शुरू हुई।

वे सब 27 हजार फुट तक जा पहुँचे। यहाँ छठवाँ शिविर लगाया गया। वे पहली बार इतनी ऊँचाई तक पहुँचे थे। सामान पहुँचा कर शेरपा नीचे लौट आए। उनके साथ तेनजिंग भी थे। लौटते वक्त दूसरे दल के लोग उन्हें मिले। उन्हें आशा थी कि इस बार एवरेस्ट पर पहुँच जाएँगे। पर एवरेस्ट अविजित रहा।

पर्वतारोही शीघ्र ही नीचे लौट आए। उन्हें सफलता की संभावना नहीं दिखाई दे रही थी। फिर मानसून भी आने वाला था। सो वे सब नीचे लौटने लगे।

मौसम बिगड़ने लगा। हिमपात शुरू हो गया। बर्फ भी धंसने लगी। किसी तरह वे एक–एक शिविर को पार करने लगे। यहीं एक दुर्घटना घटी। एक शेरपा पक्षाघात का शिकार हो गया। लेकिन वह जीवित रहा।

टिल मैन एक उदार पर्वतारोही थे। वे साहस की कद्र करते थे। उन्होंने एक प्रथा चलाई। जो शेरपा सबसे ज्यादा ऊँचाई पर पहुँचेगा, उसे 'टाइगर' की पदवी दी जाएगी। एक पदक दिया जाएगा। यों यह प्रथा पहले भी थी। पर टिल मैन ने उसे अधिकृत रूप दिया।

तेनजिंग को भी टाइगर पदक दिया गया। रिकार्ड में उनका भी नाम दर्ज किया गया। तेनजिंग बेहद खुश थे क्योंकि अब वे एक टाइगर थे। तेनजिंग कहते थे-

"शेरपाओं की जिंदगी नाविकों की जिंदगी की ही भांति होती है। वे अक्सर अपने घर परिवार से दूर रहते हैं।" सन् 1939 में तेनजिंग को फिर पहाड़ पर जाना पड़ा। पर एवरेस्ट की ओर नहीं। इस बार उन्हें एक बिलकुल नई जगह जाना था।

तिदिथ मीरः एक बड़ी चुनौती

सिंधु नदी के पार हिंदुकुश पर्वतमाला है। यह भी हिमालय का ही हिस्सा है। यहाँ तिदिथ मीर नामक एक चोटी है। तेनजिंग को यहीं एक महिला के साथ जाना था। उनका नाम था श्रीमती बेदिल स्मीटन। वे दार्जिलिंग आई थीं। शेरपाओं का चुनाव करने। तेनजिंग से पूछा गया। वे फौरन तैयार हो गए। तेनजिंग शेरपाओं के साथ लाहौर गए। वहाँ श्रीमती स्मीटन के पति थे। वे

कैप्टेन थे। उनके एक मित्र भी थे। नाम था मेजर आगिल। वे सब तिदिथ मीर की ओर जल पड़े।

यह शिखर 25,260 फुट ऊँचा है। स्मीटन का दल बेहद छोटा था। सामान भी पर्याप्त नहीं था। फिर भी वे 23 हजार फुट तक चढ़ गए। पर इसके आगे नहीं। हवा तेज थी। बर्फ से भी ठंडी। श्रीमती स्मीटन भी अच्छी पर्वतारोही थीं। वे साहसी भी थीं। अंत तक वे साथ रहीं। पर वे सब शिविर तक नहीं पहुँचे। क्योंकि उनके पास उपकरण नहीं थे। वे लौट आए। पर निराश नहीं थे। उन्होंने हिम्मत की कमी के कारण अभियान समाप्त नहीं किया था।

शेष शेरपा दार्जिलिंग लौट गए। पर तेनजिंग वहीं रह गए। चित्राल में उनकी भेंट मेजर व्हाइट से हुई। उन्होंने ही स्मीटन की सहायता की थी। मेजर व्हाइट ने तेनजिंग से पूछा, "तुम मेरे साथ काम करोगे?"

"क्यों नहीं?" उन्होंने उत्तर दिया।

और इस तरह उनकी एक नई जिंदगी शुरू हुई।

तब भारतीय सेना में एक प्रसिद्ध रेजीमेंट थी। नाम था- 'चित्राल स्काउट्स'। मेजर व्हाइट उसी में अफसर थे। तेनजिंग वहीं काम करने लगे। धीरे–धीरे कई महीने बीत गए। इसी बीच उन्हें एक बुरी खबर मिली। उनके बेटे नीमा दोरजे का देहांत हो गया था। तेनजिंग उसे बेहद प्यार करते थे। वे बहुत दुखी हुए। मेजर व्हाइट को उनसे हमदर्दी थी। वे बोले, 'तेनजिंग, तुम दार्जिलिंग जाओ। परिवार से मिल आओ। चाहो तो उन्हें भी ले आओ।'

तेनजिंग दार्जिलिंग के लिए रवाना हुए। वे वहाँ कुछ दिन रहे। उनके घर एक बेटी ने जन्म लिया। वे खुश हुए। नीमा का दुःख थोड़ा भूल गए। उन्होंने अपनी दूसरी बेटी का भी नाम रखा- 'नीमा'। फिर वे परिवार के साथ चित्राल लौट आए।

चित्राल उन्हें भा गया था। मेजर व्हाइट उन्हें बेटे के समान मानते थे।

रेजीमेंट के साथ तेनजिंग कई स्थानों पर गए। वे कश्मीर में भी रहे। वहाँ उन्होंने बर्फ पर स्कीइंग सीखी। चित्राल में उन्होंने कई भाषाएँ सीखीं। हिन्दुस्तानी, चित्राली और पश्तो। उनका अंग्रेजी का ज्ञान भी बढ़ा।

वे युद्ध के दिन थे। चारों ओर गरमागरमी थी। तभी तेनजिंग पर एक और विपत्ति आई। उनकी पत्नी दावा फुटी बीमार रहती थीं। उन्होंने उनका काफी इलाज कराया। पर उन्हें बचा न सके। सन् 1944 में उनका देहांत हो गया। उनकी दोनों बेटियाँ बिना माँ की हो गईं। उनके नाम थे पेम–पेम और नीमा। वे छोटी थीं। तेनजिंग ने उनके लिए एक आया रखी। पर उससे काम नहीं चला। तेनजिंग ने दार्जिलिंग लौटने का निश्चय किया।

सन् 1946 में वे दार्जिलिंग लौट आए। यहाँ लोगों ने उनसे दूसरा विवाह करने के लिए कहा। बच्चियों के लिए भी नई माँ जरूरी थी। तेनजिंग ने विवाह कर लिया। उनकी नई पत्नी दावा फुटी की चचेरी बहन थी। तेनजिंग उसे जानते थे। उसका नाम था- अंग लहमू।

छोटे–छोटे अभियान और एक खतरनाक सपना

अब तेनजिंग का जीवन दार्जिलिंग में बीतने लगा। बीच–बीच में वे छोटे–छोटे अभियानों पर जाते रहे। युद्ध भी समाप्त हो गया। भारत भी आजादी की राह बढ़ने लगा।

सन् 1947 आया। वसंत – पर्वतारोहण का समय।

दार्जिलिंग में डेनमान नाम के एक साहसी पर्वतारोही आए। उनका जन्म कनाडा में हुआ था। वे इंग्लैंड में पढ़े थे। फिर अफरीका में बस गए थे।

डेनमान का एक सपना था। एक खतरनाक सपना। वे एवरेस्ट पर अकेले चढ़ना चाहते थे। चुपचाप, बिना किसी ताम-झाम के। उनके पास पैसे भी ज्यादा नहीं थे। तेनजिंग डेनमान से मिले। उन्हें तेनजिंग के अनुभव के बारे में पता चला। वे उन्हें साथ चलने के लिए कहने लगे।

डेनमान जीवट के आदमी थे। उनके पास तिब्बत में जाने की अनुमति नहीं थी। फिर भी एवरेस्ट तक जाना चाहते थे – तिब्बत की ओर से। तेनजिंग विचार में पड़ गए। कैसे जाएँगे वहाँ तक। रास्ते में ही पकड़ लिए जाएँगे। उन्होंने डेनमान को समझाने की कोशिश की। पर उनका तो एक ही लक्ष्य था। एवरेस्ट।

तेनजिंग भी एवरेस्ट जाना चाहते थे। अंततः वे तैयार हो गए। किसी तरह छिपते–छिपाते, सिपाहियों से बचते, वे रोंगबुक मठ तक पहुँचे।

सामने एवरेस्ट था। गगनचुंबी। बर्फ से ढंका। तेनजिंग रोमांचित हो उठे। वे नौ वर्ष बाद उसे देख रहे थे। मन हुआ, तत्काल शिखर तक तहुँच जाएँ। पर चाहने से क्या होता है। लक्ष्य पाने के लिए परिश्रम करना पड़ता है। तेनजिंग अपने साथियों सहित शिविर बनाने लगे। वे केवल तीन व्यक्ति थे। हर दिन नया शिविर बना डालते। वे कोल तक पहुँच गए। पर इसी बीच डेनमान बेहद कमजोर हो गए। कभी–कभी तो वे चल भी नहीं पाते। फिर भी उन्होंने कोल की ढलान पर चढ़ने की कोशिश की। हवा तेज हो गई थी। ठंड अलग पड़ रही थी। एक कदम भी आगे बढ़ाना कठिन था। हार कर वे सब तम्बू में लौट आए।

पराजय। एक बार फिर पराजय। डेनमान जान गए – एवरेस्ट तक पहुँचना कठिन है। वे साहसी थे, दृढ़ निश्चयी भी थे। समझदार भी थे। वे जानते थे, आगे बढ़ना जानबूझ कर

मौत के मुँह में जाना है। उन्होंने लौटने का निश्चय कर लिया।
और वे सब तेजी से लौटने लगे।

साथी की सहायताः परम धर्म

दार्जिलिंग लौटते ही तेनजिंग को एक और काम मिल गया। एक अभियान दल गढ़वाल जा रहा था। वे भी उसमें शामिल किए गए। इस अभियान के दौरान एक घटना घट गई। शिखर पर जाते समय दो लोग दुर्घटना के शिकार हो गए। ये थे सटर नामक एक पर्वतारोही और एक शेरपा वागंडी नोबरू।

पर्वत पर शिखर की ओर जाते समय वे दोनों एक रस्सी से बंधे हुए थे। वे एक बर्फ की संकरी चट्टान पर चढ़ रहे थे। एकाएक वे फिसल गए। वे संभल न पाए और लुढ़कते–लुढ़कते हजारों फुट नीचे जा गिरे। सब लोग घबरा गए। नीचे देखा। पता ही नहीं चल रहा था कि वे जीवित हैं या मृत। उनके पास कोई जा भी नहीं सकता था। रास्ता खतरनाक और चक्करदार था। उन तक पहुँचने में घण्टों लग जाते। सौभाग्य की बात। सटर ज्यादा घायल नहीं हुए थे। पर वागंडी नोबरू के साथ और कुछ घटा था। उसका एक पैर टूट गया था। सटर उसे ऊपर तक ला नहीं सकते थे। उन्होंने जैसे–तैसे एक आपातकालीन शिविर बनाया। उसमें बागंडी नोबरू को लिटाया। उससे कहा, 'घबराना नहीं। हम लोग तुम्हें लेने आएँगे।' फिर जैसे–तैसे वे नीचे के शिविर में आए। तब तक शाम घिर आई थी। कुछ किया नहीं जा सकता था।

तेनजिंग और अन्य पर्वतारोहियों ने रात बेचैनी से काटी। दूसरे दिन तड़के ही बचाव दल चल पड़ा। उसमें तेनजिंग भी थे। और लोग बेहद थके हुए थे। पर तेनजिंग विश्राम भी कर चुके थे। ताजगी अनुभव कर रहे थे। फिर बागंडी नोबरू उनका

पुराना दोस्त था। सन् 1938 में वे साथ–साथ एवरेस्ट तक गए थे। वह उनका सहयोगी 'टाइगर' था। उसे बचाना जरूरी था।

भाग्य से मौसम ठीक था। कुछ ही घण्टों में वे वागंडी नोबरु के शिविर तक पहुँच गए। उन्होंने लपककर परदा खोला। वहाँ का दृश्य देखकर वे भौंचक्के रह गए।

वागंडी नोबरु जीवित था, पर उसके गले में एक घाव भी था।

बाद में वागंडी नोबरु ने बताया। पिछली रात वह भ्रम में पड़ गया। उसे कुछ सूझ नहीं पड़ रहा था। सटर ने क्या कहा, यह भी उसे पता नहीं था। उसे लगा, सटर उसे अकेला छोड़कर चले गए हैं। बर्फ में जम जाने के लिए। मर जाने के लिए। उसे कुछ नहीं सूझा। घबराहट में उसने खुदकुशी ही करनी चाही। उसने चाकू निकाला और अपना गला काट लिया, पर वह कमजोर था। गला पूरी तरह नहीं काट पाया। फिर उसे अपने परिवार की याद आई। उसने तय किया, मुझे जिंदा रहना है। मरना नहीं है। उसके नहीं रहने पर परिवार अनाथ हो जाएगा। वह सारी रात चुपचाप पड़ा रहा। फलतः रक्त जम गया। बहने से रुक गया। और, इस तरह वह बच गया।

तेनजिंग और उनके साथी किसी तरह स्ट्रेचर बनाकर वागंडी नोबरु को नीचे लाए। फिर उसे आधार शिविर में भेजा गया। वहाँ से चिकित्सा के लिए उसे मसूरी रवाना किया गया।

शेष पर्वतारोही फिर अपने काम में लग गए। पर वे उदास थे। कुछ–कुछ निराश भी थे। लेकिन वे केदारनाथ शिविर पर चढ़ने में सफल रहे। उनमें तेनजिंग भी थे। अब दार्जिलिंग वापसी की यात्रा शुरू हुई।

एक यात्रा पवित्र भूमि की

तिब्बत – पहाड़ों के बीच एक दुर्गम प्रदेश। दलाई लामा की जन्म–भूमि। ल्हासा – तिब्बत की राजधानी। एक पवित्र तीर्थ।

तेनजिंग कई बार तिब्बत हो आए थे। पर वे ल्हासा तक नहीं गए थे। अब उन्हें ल्हासा जाने का अवसर मिला।

क्या कोई पर्वतारोहण – अभियान था?

नहीं। यह यात्रा ज्ञान की खोज के लिए थी।

और, इस यात्रा के नेता थे, प्रोफेसर गिस्मे तुक्की।

प्रोफेसर गिस्मे तुक्की इटली के निवासी थे। पर उन्हें पौर्वात्य कला से प्रेम था। पौर्वात्य संस्कृति के वे विद्वान थे।

'पौर्वात्य' शब्द का अर्थ क्या है?'

'पौर्वात्य' का अर्थ है, पूर्व का।

धरती के दो गोलार्द्ध हैं। अर्थात दो भाग हैं। इनमें से एक पूर्वी भाग, दूसरा है पश्चिमी भाग।

पूर्व के भाग में है, भारत, चीन, जापान अर्थात एशिया।

पश्चिमी भाग में है, यूरोप, अमरीका।

पौर्वात्य कला – संस्कृति का मतलब है, पूर्व के देशों की कला और संस्कृति।

प्रो. तुक्की इन्हीं के विद्वान थे। वे सात बार तिब्बत की यात्रा कर चुके थे। पर ये यात्राएँ मनोरंजन के लिए नहीं थीं। इन यात्राओं में वे दुर्लभ ग्रन्थ खोजते थे। पुरानी कला की वस्तुएँ एकत्र करते थे।

एक बार वे फिर तिब्बत जाना चाहते थे। इसीलिए

दार्जिलिंग आए थे। यात्रा के लिए पोर्टरों की, सहायकों की जरूरत थी। और, उनके लिए दार्जिलिंग ही उपयुक्त स्थान था।

प्रो. तुक्की ने कुछ शेरपा नियुक्त किए और यात्रा पर चल पड़े। तेनजिंग इस दल में नहीं थे। उन्होंने आवेदन किया था, पर तब तक जगहें भर चुकी थीं। तेनजिंग बेहद निराश हुए। इसके दो कारण थे। एक तो उन्हें काम नहीं मिला था। दूसरे, ल्हासा जाने का अच्छा अवसर निकल गया था।

कुछ ही दिनों बाद की बात है। तेनजिंग को यात्रा में शामिल होने का निमंत्रण मिला। इसका एक कारण था। प्रो. तुक्की अपने सहायकों से संतुष्ट न थे। वे एक अच्छा सहायक चाहते थे। ऐसा सहायक, जो कई भाषाएँ जानता हो। जैसे उसे अंग्रेजी का ज्ञान हो। हिन्दुस्तानी आती हो, तिब्बती भी जानता हो। तेनजिंग में ये गुण थे। इसीलिए उन्हें बुलाया गया था।

सरदार कसापाल ने तेनजिंग को बुलाया। पूछा, 'क्या तुम प्रो. तुक्की के दल में जाओगे?' कहावत है, 'अंधा क्या चाहे? दो आंखें' तेनजिंग तो स्वयं जाना चाहते थे। वे तुरंत तैयार हो गए। एक दिन वे गंगतोक रवाना हो गए। गंगतोक – सिक्किम की राजधानी।

वहाँ तेनजिंग की प्रो. तुक्की से भेंट हुई। उन्होंने देखा, शेरपा उनसे बेहद डरते हैं। कुछ नाराज भी हैं। उनकी शिकायत थी- 'साहब बहुत ज्यादा काम लेता है।'

प्रो. तुक्की ने तेनजिंग को यों ही शामिल नहीं कर लिया। उन्होंने उनकी परीक्षा ली। तिब्बत, नेपाली, हिन्दुस्तानी, अंग्रेजी, सभी भाषाओं में कुछ सवाल पूछे। तेनजिंग ने सभी प्रश्नों के उत्तर दिए। प्रो. तुक्की उनके उत्तरों से प्रसन्न हो गए। उन्होंने तेनजिंग को दल में रख लिया।

कंचनजंगा: पाँच कोषों का महान हिम

गंगतोक में यात्रा की तैयारियाँ की जाने लगीं। फिर एक दिन यात्री–दल चल पड़ा। उसमें तीन इटली निवासी थे। एक शेरपा था। वह रसोई बनाता था। एक मंगोली लामा भी था। वह दार्जिलिंग से ल्हासा जा रहा था। इनके अलावा कई पोर्टर भी थे। प्रो. तुक्की के पास बहुत सारा सामान था। पेटियाँ थीं। बंदूकें थीं। पेटियों में उपहार भरे हुए थे। कुछ पेटियाँ खाली थीं। उसमें प्रो. तुक्की एकत्र की गईं वस्तुएँ रखते। उन्हें वे प्राणों से भी अधिक चाहते थे।

प्रो. तुक्की तेनजिंग को पसंद करने लगे थे। उन्होंने उन्हें सारे सामान का इन्चार्ज बना दिया। अपनी निजी पेटियों की भी चाबियाँ दे दीं। राह में खर्च के लिए काफी पैसा भी दिया। तेनजिंग भी उनका आदर करने लगे।

इस यात्रा में तेनजिंग को पैदल नहीं चलना पड़ा। उन्हें एक सवारी दी गई। पहाड़ी रास्ता। कहीं ऊँचा–कहीं नीचा। फिर सफर भी अजीब। कुछ पता नहीं, कहाँ जाएँगे, कब रुकेंगे, फिर कब चल पडेंगे। इसका एक कारण था। प्रो. तुक्की ज्ञान की यात्रा पर निकले थे। वे तिब्बत का चप्पा–चप्पा जानते थे। उन्हें मालूम था, कोई चीज़ कहाँ मिलेगी। बस, चलते–चलते उन्हें कोई बात सूझती, फिर वे यात्रा की दिशा बदल देते।

प्रो. तुक्की विद्वान व्यक्ति थे। कई भाषाओं के जानकार। तेनजिंग ने गिनती नहीं की कि वे कितनी भाषाएँ जानते हैं। वे तेनजिंग से एक भाषा में बात शुरू करते। फिर एकाएक दूसरी भाषा बोलना शुरू कर देते।... उनसे तेनजिंग ने बहुत–सी बातें सीखीं। तेनजिंग को ऐसा लगता था, यात्रा के साथ–साथ वे स्कूल में भी जा रहे हैं। तेनजिंग ने पहली बार अनुभव किया- बौद्ध मठ, मात्र निवास–स्थान नहीं है। वे पांडुलिपियों और कलात्मक

वस्तुओं के भंडार भी हैं। हर वस्तु का एक अर्थ होता है। एक इतिहास होता है।

तेनजिंग को भी इस यात्रा में कई नई बातें मालूम हुईं जैसे– कंचनजंगा नाम- चार तिब्बती अक्षरों से मिलकर बना है। कांग अर्थात हिम, बर्फ। चेन अर्थात महान, जोर अर्थात कोष – खजाना। और नग यानि पाँच। अतः हम ठीक–ठीक उच्चारण करें तो नाम होगा- कांग – चेन – जोर – नग। अर्थात- 'पाँच कोषों सहित महान हिम'। यहाँ पाँच कोषों का अर्थ है पाँच शिखर। इन कोषों के नाम भी हैं। जैसे- त्सा = नमक, सेर चांग – मी = स्वर्ग, धाम, चोप धांग नार = पवित्र पुस्तकें और धन। मत्सन = शस्त्र और तो चोग धांग = फसल और ओषधियाँ। तब से तेनजिंग कभी नहीं भूल पाए कि उनके पर्वत मात्र हिम और बर्फ की वस्तुएँ नहीं हैं। उनका भी इतिहास है।

धीरे–धीरे कंचनजंगा पीछे छूट गया। यात्रा–दल ने तिब्बत की ऊँची सीमा पार की। तेनजिंग के लिए वह इलाका नया था। हर चीज़ उन्हें आकर्षित कर रही थी। बीस दिन बाद वे ल्हासा पहुँचे। वहाँ उन सब का स्वागत–सत्कार हुआ। तेनजिंग तिब्बती बोलते थे। लोगों को ताज्जुब होता। तेनजिंग उनसे बताते, "मैं शेरपा हूँ।" फिर वे उनसे कई सवाल करते। एक बार एक स्वागत समारोह था। उसमें तेनजिंग से पूछा गया, "क्या चोमो–लुंगमा पर चढ़ा जा सकेगा?"

'मुनष्य के लिए कुछ भी असंभव नहीं। यदि वह कोशिश करे तो अवश्य सफल हो जाएगा।' तेनजिंग ने उत्तर दिया।

'क्या इस पर चढ़ने में डर नहीं लगता? वह तो देवों और दानवों का निवास स्थान हैं।'

"मैं मरने से नहीं डरता। सड़क पर दुर्घटना में भी आदमी मर सकता है। पर्वतों से मैं क्यों डरूं?"

ल्हासा में तेनजिंग दलाई लामा से भी मिले। वहाँ उन्हें कोई

दलाई लामा नहीं कहता। उन्हें 'ग्यालवा रिम्पोछे' कहा जाता है। ग्यालवा का अर्थ है वह, जिसने विजय प्राप्त कर ली है, जो स्वामी है। दूसरे शब्दों में बुद्ध ईश्वर। रिम्पोछे का अर्थ है मूल्यवान, पवित्र।

प्रो. तुक्की ने कई पांडुलिपियाँ एकत्र कीं। ये सब दुर्लभ थीं। फिर वे ल्हासा से चल पड़े। तेनजिंग बेहद प्रसन्न थे। वे पवित्र भूमि तक पहुँच चुके थे। उन्होंने ग्यालवा रिम्पोछे के दर्शन किए थे। उनसे बात की थी। इस यात्रा में कई घटनाएँ घटीं। अंत में वह यात्रा सफल भी रही।

प्रो. तुक्की एक पांडुलिपि की खोज में गए थे। वह संस्कृत में लिखी गई थी। दो हजार वर्ष पुरानी थी। उसे भोजपत्र पर लिखा गया था। विद्वानों का विश्वास था कि पांडुलिपि है पर उसे कोई खोज नहीं पाया। प्रो. तुक्की उसे ही खोजने आए थे। तिब्बत में धंगा नाम का मठ है। प्रो. तुक्की का विश्वास था, पांडुलिपि वहीं है। अतः सब धंगा गए। पर उसे खोजना आसान नहीं था। लामाओं को उसकी कोई जानकारी नहीं थी। फिर मठ में हजारों पांडुलिपियाँ थीं। प्रो. तुक्की निराश नहीं हुए। वे उस पांडुलिपि को खोजते रहे। पर वह नहीं मिली।

एक सुबह की बात है। तेनजिंग ने देखा, प्रो. तुक्की की कमीज बाहर है। तेनजिंग ने उनका ध्यान आकर्षित कराया। वे बोले, "मेरे लिए यह सौभाग्य सूचक चिह्न है। शायद वह पांडुलिपि हमें आज ही मिल जाए।" और सचमुच, वह उन्हें उस दिन मिल गई। भाग्य की बात। पांडुलिपि तेनजिंग को ही मिली। वहाँ ढेर सारी पांडुलिपियाँ थीं। वह उन्हीं के नीचे दबी पड़ी थी। प्रो. तुक्की ने तेनजिंग को उसके बारे में काफी जानकारी दी थी। उसे देखते ही तेनजिंग जान गए, यही पांडुलिपि है। तेनजिंग उसे उनके पास ले गए। उसे देखते ही प्रो. तुक्की खुशी से उछल पड़े।

प्रो. तुक्की ने अब लामाओं से बात की। कहा, 'वे चाहें

जितना धन ले लें, पांडुलिपि उन्हें दे दें।' पर लामा पैसे लेने को तैयार नहीं थे। उनका कहना था, ज्ञान बेचा नहीं जाता। जिसे उसकी चाह है, उसे तो वह निःशुल्क मिलना चाहिए। लामाओं ने कहा, वे पांडुलिपि इटली ले जाएँ। उसकी प्रतिलिपियाँ करा लें। फिर मूल पांडुलिपि उनके पास भेज दें।

प्रो. तुक्की इस प्रस्ताव पर राजी हो गए। उन्होंने मठ में पाँच सौ रुपये चढ़ाए। लामाओं को धन्दवाद दिया। फिर लौट पड़े। वे अपने लक्ष्य को पाने में सफल हुए थे। प्रयत्नों से सफलता मिलती ही है। भले देर से मिले।

एवरेस्ट की ओर-एक नई दिशा से

तेनजिंग कई स्थानों की यात्रा कर चुके थे। कई शिविरों पर चढ़े थे। पर उनका एक सपना अभी पूरा नहीं हुआ था। यह सपना था- चोमो–लुंगमा तक पहुँचने का। चौदह वर्ष पहले वे उस पर चढ़े थे। तब उन्होंने टाइगर का खिताब जीता था। कभी–कभी वे सोचते, अचरज करते- 'क्या वे कभी वहाँ पहुँच पाएँगे। या देवता उन्हें इस प्रिय पर्वत से दूर ही रखेंगे?'

पर देवता उन पर कृपालु थे। वे तीस वर्ष के हो रहे थे। शीघ्र ही उन्हें एक महत्वपूर्ण उपलब्धि होने वाली थी। यह उपलब्धि क्या थी? यह थी, एक बार फिर एवरेस्ट की यात्रा। इस बार यात्रा का मार्ग नया था। इस बार नेपाल की ओर से उस पर जाना था। अर्थात दक्षिण से उत्तर की ओर।

सन् 1952–

एवरेस्ट के लिए एक नया अभियान शुरू हुआ। इस अभियान दल के नेता थे- डॉ. वापस डू नंत। तेनजिंग उनसे मिल चुके थे। एक और पर्वतारोही थे। नाम था- रेमंड लैम्बर्ट। लोग प्यार से उन्हें 'भालू' कहते थे। वे आलपस पर्वत पर चढ़ाई किया

करते थे। इसी कारण, एक बार बर्फ से उनके पैरों की अंगुलियाँ गल गईं थीं। पर लेम्बर्ट हिम्मती थे। वे अपने छोटे–छोटे पैरों के सहारे ही एवरेस्ट पर चढ़ना चाहते थे।

यात्रा शुरू हुई।

एक दिन वे एवरेस्ट की तलहटी में पहुँच गए। आधार शिविर बनाया गया। फिर नए–नए शिविर बनाने का काम शुरू हुआ। पर्वतारोही आगे बढ़ते गए। तेनजिंग लैम्बर्ट के साथ थे। उनके पीछे एक और टीम थी। उसमें डिट्रेल नामक पर्वतारोही था।

तेनजिंग और लैम्बर्ट आगे–आगे थे। धीरे–धीरे वे एवरेस्ट के दक्षिणी शिखर के पास तक पहुँच गए। पर असली शिखर तो दूर था। फिर भी वे 28,250 फुट की ऊँचाई तक पहुँच गए थे।

पहली बार मनुष्य इतनी ऊँचाई तक पहुँचा था। पर एवरेस्ट तो अभी दूर था। लेकिन अब आगे बढ़ना कठिन था। आगे बढ़ना तो संभव था, पर लौटना कठिन। क्या किया जाए?

आगे बढ़ा जाए। या नीचे लौटा जाए। तेनजिंग और लैम्बर्ट विचार करते रहे। उन्होंने देखा, शिखर तक पहुँचना कठिन है। आगे बढ़ने का अर्थ है- मृत्यु। निराश हो वे नीचे उतरने लगे। मन भारी हो गया। लेकिन उन्हें एक विश्वास था। शायद अगले प्रयत्न में वे शिखर तक पहुँच जाएँ।

एवरेस्ट सातवीं यात्रा

सन् 1953!

एवरेस्ट पर एक नए अभियान की तैयारी। इस बार दल के नेता थे- कर्नल हंट। उसमें एडमंड हिलेरी भी थे। तेनजिंग को भी चलने का निमंत्रण मिला। वे तो तैयार ही बैठे थे।

एक बार फिर यात्रा शुरू हुई। इस बार अभियान–दल काफी बड़ा था। दार्जिलिंग से काठमांडू। काठमांडू से नामचे बाजार। फिर चढ़ाई। एक दिन अभियान–दल थ्यांगबोचे मठ पहुँच गया। वहाँ वे कुछ दिन रहे। उद्देश्य था– वहाँ की जलवायु के अभ्यस्त हो जाएँ।

इसी बीच कर्नल हंट शिखर पर अभियान की योजना बना रहे थे। उन्होंने तेनजिंग से एक वायदा किया था। यदि उनका स्वास्थ्य और शारीरिक स्थिति अच्छी रही तो उन्हें शिखर पर चढ़ने का अवसर दिया जाएगा। डाक्टरी जांच हुई। तेनजिंग सबसे अधिक 'फिट' पाए गए। शिखर पर दो अभियान किए जाने थे। इसके लिए दो दल बनाए गए थे। एक में थे हिलेरी और तेनजिंग। दूसरे में डॉ. ईवान्स और बोरडिलन।

अन्य शेरपाओं को यह मालूम हुआ। उन्होंने तेनजिंग से कहा कि वे पागल हो गए हैं। हो सकता है, अभियान के दौरान उनकी मृत्यु हो जाए। तब वे उनकी पत्नी को किस तरह मुँह दिखाएंगे? उनकी और भी शंकाएँ थीं। उनका कहना था कि एवरेस्ट विजय के बाद अभियान बंद हो जाएंगे। तब उनकी रोजी–रोटी मारी जाएगी। लेकिन तेनजिंग ने सब को संतुष्ट किया।

अब तेनजिंग हिलेरी के साथ ही रहते। वे कम से कम बोझ उठाते। आधार शिविर और पश्चिमी क्वम के बीच आते जाते। ऑक्सीजन के उपकरणों का अभ्यास करते। नौसिखिये शेरपाओं को सपाट ढलान वाले मार्ग में सहायता पहुँचाते।

तेनजिंग और हिलेरी एक दूसरे को अच्छी तरह समझने लगे थे।

एक दिन की बात है। वे दोनों शिविर दो से शिविर एक की ओर आ रहे थे। वे आपस में रस्सी से बंधे हुए थे। हिलेरी आगे, तेनजिंग पीछे। वे लोग बर्फ की ऊँची–ऊँची दीवारों के मध्य अपना मार्ग बना रहे थे। सहसा हिलेरी के पैरों के नीचे की बर्फ खिसक गई और वे एक दरार में गिर पड़े।

'तेनजिंग–तेनजिंग' उन्होंने पुकारा।

सौभाग्य से दोनों के बीच ज्यादा बड़ी रस्सी नहीं थी। फिर तेनजिंग ऐसी किसी दुर्घटना के प्रति सतर्क भी थे। उन्होंने फौरन कुल्हाड़ी बर्फ में गाड़ी और स्वयं उसकी बगल में लेटकर उन्हें गिरने से रोकने लगे। वे पन्द्रह फुट नीचे जा गिरे थे। धीरे–धीरे उन्होंने उन्हें ऊपर खींच लिया। जब तक वे ऊपर आए, तेनजिंग के दस्ताने तार–तार हो चुके थे, पर हाथ सही सलामत थे। हाँ, यहाँ–वहाँ खरोचें लग गई थीं। हिलेरी को कोई चोट नहीं पहुँची थी। वे बोले, "शाबाश तेनजिंग, बहुत अच्छा किया।"

बाद में शिविर में जाकर हिलेरी ने और लोगों को बताया कि यदि आज तेनजिंग नहीं होता तो मैं कहीं का नहीं रहता।

निरंतर कामः सफलता का एक सूत्र

एवरेस्ट में क्वम नाम की जगह है। यह आइरिश नाम है। यह नाम मेलोरी ने रखा था। क्वम में कई शिविर लगाए गए। तीसरा, चौथा, पाँचवाँ। एक वर्ष पहले स्विस लोगों ने भी यहीं

शिविर लगाए थे। तब लौटते वक्त स्विस लोग शिविर में काफी सामान छोड़ गए थे। इसमें खाद्य सामग्री थी। तेनजिंग को यह पता था। उन्होंने बर्फ खोद कर यह सारी सामग्री निकाल ली।

इधर हिलेरी और तेनजिंग क्वम में व्यस्त थे। उधर दूसरे लोग साउथ कोल तक मार्ग बनाने में जुटे थे। इस काम में तीन सप्ताह का समय लगा। ऊँचाई पर कुछ लोगों की तबीयत बिगड़ जाती है। उस समय भी दो लोगों की तबीयत बिगड़ गई। दोनों को नीचे आना पड़ा। ये दोनों युवा पर्वतारोही थे। पर्वतों पर नए युवा लोगों को, अनुभवी पुराने लोगों की बनिस्बत ज्यादा तकलीफ होती है।

एवरेस्ट पर सभी को तकलीफ होती है। थकान, ठण्ड के कारण जमने का भय, हवा की कमी की तकलीफ। सिरदर्द भी होता है। गले में खराश हो जाती है। ऊँचाई पर नींद भी नहीं आती। अंग्रेज पर्वतारोही नींद की गोलियाँ खाकर सोते थे। पर तेनजिंग ने कभी उनका उपयोग नहीं किया। वे जितनी ऊँचाई पर जाते थे, उतना उन्हें अच्छा लगता था। उनकी सफलता का एक राज था। वे हमेशा स्वयं को व्यस्त रखते थे। इस कारण वे हमेशा स्वस्थ और तरोताजा रहते थे। वे सामान की देखभाल करते, तम्बू में चीजें करीने से रखते। बर्फ गरम कर पानी तैयार करते। और जब कोई काम नहीं होता तो बर्फ या चट्टान पर हाथ—पांव फटकारते। उद्देश्य यही था- व्यस्त रहो। ताकि रक्त संचार बना रहे। कमजोरी न आने पाए।

बहुत ऊँचाई पर भूख भी नहीं लगती। जबरन भोजन करना पड़ता है। हवा की कमी के कारण प्यास भी ज्यादा लगती है। तेनजिंग कहते थे कि ऐसे समय बर्फ खाना या ठंडा पानी पीना बुरा होता है। इससे गला और सूख जाता है। खराश हो जाती है। पर 1953 के अभियान में एक अच्छी बात थी। नींबू का सूखा चूरा बहुत था। वे इसी को पीते थे।

उधर लोतसे शिखर पर काम जारी था। साउथ कोल के मार्ग पर शिविर छह और सात लगा दिए गए थे। कभी–कभी अंधड़ आता और काम बंद कर देना पड़ता। कभी गलत काम हो जाते। फिर भी काम जारी रहा। 20 मई को अग्रिम दस्ता साउथ कोल पर पहुँच गया। इस दस्ते में बिलफ्रेड नोयस और 16 शेरपा थे। अगले दिन उन्हें और ऊपर जाना था। क्वम में मौजूद लोग दूरबीन की सहायता से उन्हें देख रहे थे। उन्होंने देखा, केवल दो लोग जा रहे थे। वे सब चिंता में पड़ गए। कहीं कोई गड़बड़ थी।

कर्नल हंट नहीं चाहते थे कि शिखर पर जाने वाले लोग गड़बडी का पता लगाने जाएँ। कारण, वे थक जाते। पर किसी न किसी को तो जाना ही था। अंत में हिलेरी और तेनजिंग जाने के लिए तैयार हुए। तेनजिंग ने कहा, "यदि शेरपाओं को कोई तकलीफ है तो मुझे ही जाना चाहिए। मैं उनसे बात करूँगा। उन्हें आगे भेजूँगा।"

शीघ्र ही वे दोनों चल पड़े। धीरे–धीरे वे लोत्से पर स्थापित शिविर सात में पहुँचे। तब तक दोपहर हो गई थी। वहाँ पहुँचने पर पता चला कि शेरपाओं को थोड़ी बहुत तकलीफ तो है, पर वे बीमार नहीं हैं। असल में वे पहाड़ों पर ऊपर जाने से डर रहे थे। तेनजिंग ने उन्हें समझाया तो वे अगले दिन जाने के लिए तैयार हो गए। दूसरे दिन यात्रा शुरू हुई। यह तय किया गया कि तेनजिंग और हिलेरी शिविर सात के आगे नहीं जाएँगे। पर वे दोनों चाहते थे कि जब यहाँ तक आ ही गए हैं, तब काम भी पूरा हो जाए। वे शेरपाओं को लेकर कोल तक गए और फिर उसी दिन शिविर चार पर लौट आए। तीस घंटों में उन्होंने पाँच हजार फुट की चढ़ाई–उतराई की। वे थक चुके थे, पर बिलकुल टूटे नहीं थे। थोड़े विश्राम के बाद वे फिर ठीक हो गये।

शिखर पर चढ़ने की अंतिम लड़ाई

अब शिखर पर चढ़ने की अंतिम लड़ाई बाकी थी। योजना थी कि कर्नल हंट और शेरपाओं के साथ बोरडिलन और ईवान्स पहले कोल पर जाएँगे। एक दिन बाद तेनजिंग और हिलेरी। यदि बोरडिलन और इवान्स असफल होते तो ये लोग जाते।

23 मई को बोरडिलन और ईवान्स का दल रवाना हुआ और 25 मई को तेनजिंग और हिलेरी का दल।

तेनजिंग ने अपनी कुल्हाड़ी पर चार ध्वज लपेट रखे थे। इनमें दो तो ब्रिटेन और संयुक्त राष्ट्र संघ के थे, एक नेपाल का और एक भारतीय। नेपाली ध्वज काठमांडू में दिया गया था और भारतीय ध्वज दार्जिलिंग में तेनजिंग के एक अभिन्न मित्र ने दिया था। बोरडिलन और ईवान्स के पास भी ध्वज थे।

शिविर सात में उन्होंने फिर रात बिताई। सुबह आसमान साफ था। वे फिर रवाना हुए। उन्होंने दक्षिण शिविर के पीछे दो बिन्दु देखे। वे बोरडिलन और ईवान्स थे। इसके बाद वे नजरों से ओझल हो गए।

उधर तेनजिंग और हिलेरी पर्वत पर चढ़ाई करने लगे। जब वे शिविर आठ पर पहुँचे तो उन्हें वहाँ केवल शेरपा अंग तेनजिंग मिला। वे उसे 'भालू' कहते थे। उसकी तबीयत खराब हो गई थी। उसने बताया कि बोरडिलन और ईवान्स जहाँ तक जा पाएँगे, कर्नल हंट तथा शेरपा दा नाम ग्याला सबसे ऊँचे शिविर तक रसद और सामान पहुँचाएंगे। ताकि जरूरत पड़ने पर तेनजिंग और हिलेरी उसका उपयोग कर सकें।

तेनजिंग और हिलेरी कोल पहुँचे। उन्होंने देखा कि कर्नल हंट और दा नाम ग्याला दक्षिण पूर्व पहाड़ी से नीचे आ रहे हैं। वे बेहद थके हुए थे। थोड़ी देर के लिए कर्नल साहब गिर पड़े। तेनजिंग ने उन्हें नींबू पानी पिलाया। फिर एक तंबू में ले गए।

उन्होंने बताया कि वे 27,350 फुट तक पहुँच सके थे। एक वर्ष पहले तेनजिंग और लेम्बर्ट जहाँ तक पहुँचे थे, उससे वह दो सौ फुट ज्यादा था। वे 28 हजार फुट तक जाना चाहते थे, पर नहीं जा पाए। इसीलिए उन्होंने शिविर नौ पर सामान छोड़ दिया था। इनमें उनके ऑक्सीजन टैंक भी थे। वे बिना उसकी सहायता के नीचे आए थे, इसीलिए थक भी गए थे। अब वे सब बोरडिलन और ईवान्स की प्रतीक्षा करने लगे।

कर्नल हंट ने कहा, ''यदि दोनों शिखर पर चढ़ जाएँ तो अच्छा होगा क्योंकि रानी का राज्यारोहण होनेवाला है।'' एक पल के लिए तेनजिंग ने सोचा, 'तो इसीलिए पहले दोनों अंग्रेज गए।' पर दूसरे ही क्षण उन्होंने सोचा, 'यह मूर्खतापूर्ण विचार है।' यहाँ कोई प्रथम या द्वितीय नहीं होता। यहाँ केवल एवरेस्ट है और किसी न किसी को उस पर चढ़ना चाहिए। हिलेरी और मेरे लिए सामान पहुँचाने में हंट ने तो प्रायः अपनी जान दे दी थी।' बाद में हंट आदि नीचे चले गए।

कोल में भयानक ठंड थी। हवा भी तेज थी। तेनजिंग के शब्दों में – ''हमारे साथ कोल पर अब केवल तीन शेरपा थे – अंगचिमा, अंगतेम्बा और पेम्बा।

वे सब प्रतीक्षा करते रहे। दोपहर में उन्हें ढलान पर दो आकृतियाँ नजर आईं। तेनजिंग ने सोचा, 'शायद वे शिखर पर नहीं चढ़ पाए। पर कुछ कहना कठिन था। तेनजिंग और दा नामग्याला उनसे मिलने आगे बढ़े। वे बेहद थक गए थे। उन्होंने बताया, वे शिखर पर नहीं चढ़ पाए। वे उससे कुछ सौ फुट नीचे तक ही पहुँच पाए थे। उससे आगे वे नहीं जा सकते थे। ताकत नहीं थी। वे जाते तो शायद फिर लौट नहीं पाते। रात हो जाती और उसके साथ ही मौत भी। वे इस बात को जानते थे, इसीलिए लौट आए।

ईवान्स ने कहा, 'तेनजिंग, मुझे विश्वास है तुम और हिलेरी शिखर तक अवश्य पहुँचोगे। पर चढ़ाई कठिन है। सबसे ऊँचे शिविर से ऊपर जाने में चार–पाँच घण्टे लगेंगे। चढ़ाई खतरनाक भी है, सावधान रहना। यदि मौसम ठीक रहा तो तुम अवश्य चढ़ पाओगे। तब अगले वर्ष तुम्हें चढ़ना नहीं पड़ेगा।'

तेनजिंग और हिलेरी ने उनसे कई सवाल पूछे। ईवान्स और बोरडिलन ने उनके उत्तर दिए। उन्होंने उन्हें उचित सलाह भी दी। पहाड़ों पर इसी तरह की पारस्परिक सहायता जरूरी होती है। इसी तरह आपसी सहयोग की भावना मनुष्य को महान बनाती है। यदि वे लोग न होते, तेनजिंग और हिलेरी क्या सफल हो पाते! वह रात उन लोगों ने कोल पर बिताई। वे कुल दस लोग थे।

खराब मौसम : सफलता की शुभ कामना

सुबह हुई तो मौसम खराब था। हवा तेज चल रही थी। मानो हजारों चीते एक साथ गुर्रा रहे हों। वे सब उसके थमने की प्रतीक्षा करने लगे। दोपहर तक हवा बंद हो गई। बोरडिलन और ईवान्स नीचे जाने की तैयारी करने लगे।

'गुड लक' कहकर ईवान्स अपने साथियों के साथ नीचे चल पड़े।

अब शिविर आठ पर छह लोग बच गए-लोबे, ग्रगोरी और अंग न्यिमा' पेम्बरू, हिलेरी और तेनजिंग।

रात हुई, मौसम अभी भी बहुत खराब था। साहबों ने नींद की गोली खाई।

तेनजिंग बताते हैं- "मैं अंधकार में पड़ा, हवा की आवाज सुनता रहा। सोचता रहा, हवा बंद होनी चाहिए। ताकि हम कल ऊपर जा सकें। मैं सात बार एवरेस्ट आ चुका हूँ। मैं एवरेस्ट को

प्यार करता हूँ। पर सात प्रयत्न पर्याप्त हैं। यहाँ से हमें अवश्य शिखर पर पहुँचना चाहिए। इस बार अवश्य। इसी वक्त अवश्य। घंटा बीता, फिर दूसरा, धीरे–धीरे झपकी लगने लगी। फिर नींद खुली। फिर झपकी लगी। अर्ध निंद्रा की अवस्था। अंधकार में मेरा दिमाग यहाँ–वहाँ भटकने लगा। एवरेस्ट पर कितने लोगों के प्राण गए। किसी युद्ध भूमि की भांति। पर एक दिन मनुष्य को विजयी होना ही है।और जब वह विजयी होगा, तब...। अचानक मुझे प्रो. तुक्की की याद आ गई। उन्होंने मुझसे कहा था कि वे मुझे पंडित नेहरू से मिलवाएँगे। यदि मैं शिखर पर चढ़ने में सफल हुआ तो शायद वह संभव हो जाएगा।

फिर मुझे सोलो खुम्बू, अपने पुराने घर तथा माता–पिता की याद आई। मुझे ईश्वर के प्रति उनका विश्वास याद आया। मेरे लिए की गई प्रार्थनाएँ याद आईं। फिर मैं स्वयं प्रार्थना करने लगा– ईश्वर की प्रार्थना, एवरेस्ट की प्रार्थना। फिर मैंने विचार करना छोड़ दिया, मैं सपना देखने लगा। मैंने देखा, चारागाह में याक चर रहे हैं, फिर एक सफेद घोड़ा मुझे नजर आया। शेरपाओं का विश्वास है कि स्वप्न में पशुओं का दिखाई देना शुभ होता है। मैंने उनका ही स्वप्न देखा। याकों और घोडों के पीछे एक और सपना था- आकाश में उठता एक धवल सपना।"

28 मई। ठीक एक वर्ष पहले तेनजिंग और स्विस पर्वतारोही लैम्बर्ट ने एवरेस्ट पर चढ़ाई की अंतिम कोशिश की थी। सुबह हुई तो हवा तेज चल रही थी। पर आठ बजे तक हवा बंद हो गई। पेंबा बीमार था, अतः ऊपर नहीं जा सकता था। अब केवल एक शेरपा अंगन्यिमा बच गया था। इसका अर्थ यह था कि शेष लोगों को ज्यादा बोझा ले जाना पड़ेगा। 9 बजे लोबे, ग्रेगोरी और अंगन्यिमा शिविर से निकले। वे चालीस पौंड वजन और ऑक्सीजन–उपकरण ले जा रहे थे। एक घंटे बाद तेनजिंग और हिलेरी रवाना हुए। ये लोग पचास पौंड वजन ले जा रहे थे।

लोबे आदि बर्फ पर सीढ़ियाँ काटने वाले थे। इससे वे और हिलेरी बिना थके आगे बढ़ सकते थे।

वे सब कोल की बर्फीली चट्टानों से आगे बढ़े। धीरे—धीरे वे दक्षिण पूर्वी पहाड़ी की ओर जाने लगे। दोपहर तक तेनजिंग और हिलेरी पहले वाले दल के साथ मिल गये। थोड़ी ऊँचाई पर एक तम्बू के टुकड़े पड़े हुए थे। इन तम्बुओं को पिछले साल तेनजिंग और लैम्बर्ट ने स्थापित किया था।

अब खड़ी चढ़ाई थी, इसलिए वे सब धीरे-धीरे आगे बढ़ रहे थे। बर्फ जमी थी। इसलिए दुबारा सीढ़ियाँ काटनी पड़ीं। दो बजे तक वे सब बेहद थक गये। तय हुआ कि शिविर के लिए उपयुक्त स्थान खोजा जाए। तेनजिंग को याद था कि यहीं कहीं, उन्होंने और लैम्बर्ट ने शिविर लगाया था। वे उस स्थान को ढूंढ़ने लगे। शीघ्र ही वह स्थान मिल गया। अब लोवे, ग्रेगोरी और अंगन्यिमा कोल के लिए लौट पड़े। तेनजिंग और हिलेरी अकेले रह गये। इस समय वे 24,700 फुट की ऊँचाई पर थे। विश्व का चौथा ऊँचा शिखर लोत्से, जिसे वे रोज देखा करते थे। अब उनके नीचे था। दक्षिण पूर्व में मकालू था। सैंकड़ों मील तक सब—कुछ नीचा ही नीचा नजर आ रहा था। दूर पूर्व में कंचनजंगा की सफेद रिज़ दिखायी दे रही थी।

तेनजिंग और हिलेरी ने शिविर लगाने की तैयारी शुरू की। वह सबसे ऊँचाई पर लगने वाला शिविर था। शाम तक शिविर तैयार हो गया। उन्होंने बर्फ काट कर सोने लायक स्थान बनाया। फिर उन्होंने बर्फ के कारण अकड़ गई रस्सी और केनवास को ठीक कर ऑक्सीजन के सिलेंडर गाड़े। किसी तरह शिविर लगाकर वे उसके बीच घुस गए। हलकी हवा चल रही थी। भीतर ठंड भी ज्यादा नहीं थी। हिलेरी ने ऑक्सीजन सेटों की जाँच की। तेनजिंग ने स्टोव गरम कर काफी और नींबू पानी तैयार किया। इस समय दोनों को बेहद प्यास लग रही थी। उनके पास

फल थे, बिस्कुट थे, सूप था। पर फल बर्फ के कारण जम गए थे और उन्हें स्टोव पर गरम करना पड़ा।

धीरे–धीरे रात घिर आई। समय बीतने लगा। आधी रात को हवा बिलकुल बंद हो गई। 29 मई। ठीक एक वर्ष पहले 29 मई को तेनजिंग और लैम्बर्ट पराजित होकर नीचे लोटे थे।

आखिरी बाधा

सुबह लगभग साढ़े तीन बजे वे जागे। तेनजिंग ने फिर स्टोव जलाया। नींबू पानी के लिए बर्फ पिघलायी। थोड़ा बहुत खाया। हवा बिलकुल बंद थी। थोड़ी ही देर बाद उन्होंने तम्बू का परदा सरकाया। पौ फट रही थी। तेनजिंग ने 16,000 फुट नीचे चमक रहे थ्यांगबोचे मठ की ओर इशारा किया। तेनजिंग ने मन ही मन प्रार्थना की- 'मेरे माता–पिता के ईश्वर – आज मुझ पर कृपा करो।'

पर इस बीच एक गड़बड़ हो गई। हिलेरी ने अपने बूट उतार कर रख दिए थे। वे ठंड में अकड़ गए। किसी तरह उन्हें ठीक किया गया। इस अंतिम चढ़ाई के लिए तेनजिंग ने विभिंन्न जगहों की चीजें पहनी थीं। उनके जूते स्विस थे। बंद जैकेट और दूसरी चीजें ब्रिटिश थीं। मोजे अंग लहमू ने बुने थे। स्वेटर हिमालयन क्लब की श्रीमती मेड्रीसन ने दिया था। ऊनी टोप डेनमार्क का था ओर गले में लाल स्कार्फ रेमंड लैम्बर्ट का था।

साढ़े छह बजे वे तम्बू के बाहर निकले। वातावरण शांत, स्वच्छ और हवायुक्त था। 'हमने हाथों में तीन दस्ताने पहने – सिल्क, ऊन और विंडप्रूफ के। जूतों में कैम्पटन कसे और पीठ पर चालीस पौंड का ऑक्सीजन उपकरण था। मेरी कुल्हाड़ी पर चारों ध्वज लिपटे थे। जेब में एक छोटी लाल–नीली पेंसिल थी।

"सब तैयार।" "अच्छा तैयार।" और हम चल पड़े।

चूंकि हिलेरी के जूते सख्त थे, इसलिए उन्होंने तनेजिंग को आगे चलने को कहा।

थोड़ी देर बाद वे उस स्थान पर पहुँचे, जहाँ से पिछले वर्ष तेनजिंग और लैम्बर्ट लौटे थे। ईवान्स और बोरडिलन उनके लिए दो शीशियाँ ऑक्सीजन की छोड़ आए थे। दोनों ने उन्हें खोजा।

नौ बजे तक वे दक्षिणी शिखर पर थे। ईवान्स और बोरडिलन यहीं तक पहुँचे थे। दस मिनट तक तेनजिंग और हिलेरी ने यहाँ विश्राम किया। अब उन्हें केवल तीन सौ फुट जाना था। पर रास्ता बेहद संकरा और सपाट था। वह खतरनाक भी था। बायीं ओर नीचे शिविर चार के सफेद तम्बू नजर आ रहे थे। दायीं ओर बर्फ की चट्टानें थीं। उन्हें इन्हीं में से गुजरना था।

वे फिर आगे बढ़े।

दक्षिणी शिविर से उन्हें नीचे, फिर ऊपर और ऊपर जाना था। वहाँ बर्फ के खिसकने का खतरा था। यह भी हो सकता था कि उनके बोझ से बर्फ टूट जाती। अतः सावधानी जरूरी थी। मौसम अच्छा था। वे थके भी नहीं थे। धीरे–धीरे वे आगे बढ़ते गए।

अब शिखर और उनके बीच एक आखिरी बाधा थी। यहाँ एक सीधी चट्टान रास्ता रोके खड़ी थी।

सपना पूरा हुआ

रास्ता खोजने हिलेरी आगे बढ़े। इसमें उन्हें पीछे की ओर पैरों पर झुकना पड़ता और तेनजिंग को नीचे से उन्हें सहारा देना पड़ता। किसी तरह हिलेरी उस चट्टान पर चढ़ गए। फिर उनकी रस्सी के सहारे तेनजिंग भी उस पर चढ़ गए।

यहाँ उन्होंने थोड़ी देर फिर विश्राम किया। कुछ देर बाद वे फिर आगे बढ़े। आगे चलने पर उन्हें एक नंगी चट्टान दिखाई दी। यहाँ तेनजिंग ने दो पत्थर उठाकर जेब में रख लिए। तीन फुट चलकर वे फिर रुके और सामने देखा। फिर वे चल पड़े। शिखर के नीचे पहुँच कर दोनों रुक गए। दोनों के बीच तीस फुट रस्सी थी। तेनजिंग ने उसे लपेट रखा था और दोनों के मध्य छह फुट का फासला था।

उस समय का अनुभव तेनजिंग बताते हैं-

''मैं उस समय 'पहले' और 'दूसरे' के बारे में विचार नहीं कर रहा था। मैंने यह नहीं सोचा कि वहाँ सोने का सेब है और हिलेरी को धक्का देकर उसे लपकने पहुँचूं। हम धीरे--धीरे आगे बढ़े और अगले क्षण शिखर पर थे। पहले हिलेरी पहुँचे, और फिर मैं।''

शिखर पर पहुँचते ही दोनों ने हाथ मिलाया। तेनजिंग ने हवा में हाथ हिलाकर हिलेरी को आलिंगन में ले लिया। वे दोनों मारे खुशी के कूदने लगे। इस समय दिन के 11 बजकर 30 मिनट हुए थे। आकाश गहरा नीला था। सूरज तेजी से चमक रहा था। तिब्बत की ओर से हवा हलके–हलके बह रही थी। उन लोगों ने ऑक्सीजन बदं कर दी। शिखर कर उसके बिना रहा जा सकता है।

हिलेरी ने कैमरा निकाला। तेनजिंग ने अपनी कुल्हाड़ी ऊपर की। उस पर ध्वज लिपटे हुए थे। तेनजिंग ने हिलेरी से कहा कि अब मैं आपका फोटो ले लूं, पर हिलेरी ने इनकार कर दिया। हिलेरी चारों ओर के चित्र लेने लगे।

इसी बीच तेनजिंग ने अपनी जेब से मिठाइयाँ निकालीं। बेटी नीमा द्वारा दी गई पेंसिल भी निकाली और फिर बर्फ को खोद कर ये चीजें उसमें गाड़ दीं। हिलेरी ने उन्हें कपड़े की एक बिल्ली

दी। यह अभियान का प्रतीक चिह्न थी। तेनजिंग ने उसे भी गाड़ दिया।

तेनजिंग कहते हैं-

''मैंने सोचा, घर पर हम अपने प्रियजन को मिठाई देते हैं। एवरेस्ट भी मुझे हमेशा प्रिय रहा है। और आज तो बेहद पास भी हैं।''

मैंने भेंट चढ़ाकर उन्हें बर्फ से ढंक दिया। फिर प्रार्थना करने लगा। मैंने ईश्वर को धन्यवाद दिया। मुझे अपने सपनों के पर्वत पर सात बार आना पड़ा। और इस सातवीं बार ईश्वर की कृपा से मेरा वह सपना पूरा हुआ।

चोमो-लुंगमा मैं आभारी हूँ...

शिखर पर हम पन्द्रह मिनट रहे। अब वापस लौटना था। वापसी के लिए कुल्हाड़ी की जरूरत पड़ती, अतः मैंने ध्वजाओं को शिखर पर फैला दिया और रस्सी के दोनों छोरों को बर्फ में अच्छी तरह दबा दिया।

अब वे नीचे की ओर लौट पड़े। पर नीचे आने में भी बेहद सावधानी की जरूरत थी। वे थके हुए थे और पर्वतों पर अक्सर बेहद थकान के दौरान जरा-सी लापरवाही बरतने से दुर्घटना हो जाती है। एक घंटे बाद वे दक्षिणी शिखर पर पहुँच गए। पहले हिलेरी, उनके पीछे तेनजिंग। वे थके तो थे पर बुरी तरह नहीं। इस समय सबसे बड़ी समस्या प्यास और पानी की थी, कारण फ्लास्क का पानी जम चुका था।

दक्षिण शिखर पर कुछ देर विश्राम करने के बाद वे पुनः नीचे आए। उतरना चढ़ने से ज्यादा खतरनाक था।

धीरे-धीरे वे खतरनाक रास्ता पार कर सुरक्षित स्थान पर पहुँचे। वहाँ उन्हें बोरडिलन और ईवान्स द्वारा छोड़ी गई ऑक्सीजन की दो बोतलें मिल गईं। यह अच्छा हुआ क्योंकि उनकी ऑक्सीजन समाप्त हो रही थी।

दो बजे वे सबसे ऊँचाई पर स्थित शिविर पर पहुँचे। वहाँ तेनजिंग ने पानी गरम कर लेमनजूस तैयार किया।

वे फिर नीचे उतरने लगे।

व्यर्थ के विवाद

2 जून, 1953

आज से चौंतीस वर्ष पहले का समय। तब हम लोग कॉलेज के छात्र थे। उन दिनों समाचार पत्रों में कुछ खबरें रोज छपती थीं। ये खबरें इंग्लैंड की राजकुमारी एलिजाबेथ द्वितीय के राज्यारोहण से संबंधित होतीं। इन्हीं खबरों के बीच एक सनसनीखेज खबर छपी। सभी समाचार पत्रों में बड़े-बड़े शीर्षक।

''एवरेस्ट पराजित।''

''एडमंड हिलेरी और तेनजिंग नोरगे शिखर पर चढ़ने में सफल'' यह एक ऐतिहासिक खबर थी।

सारा संसार रोमांचित हो उठा था। इस खबर से हम लोग भी रोमांचित हो उठे थे।

अंततः एवरेस्ट पर मनुष्य पहुँच ही गया था। मनुष्य की एवरेस्ट-विजय ने हम सबको एक सीख भी दी थी। मनुष्य चाहे तो क्या नहीं कर सकता। ईमानदारी से किए गए प्रयत्न सफल होते ही हैं, भले ही पहले असफलताएं मिलें।

पर एवरेस्ट-विजय का यह समाचार विवादों से भी भरा था। कुछ लोगों का यह ख्याल था कि यह खबर सच नहीं है। एलिजाबेथ द्वितीय की ताजपोशी के लिए जानबूझ कर गढ़ी गई है। ऐसा बोलने के लिए एक कारण भी था। एक दिन पहले ही यह समाचार छपा था कि एवरेस्ट-विजय का प्रयत्न असफल रहा है।

तेनजिंग ने अपनी आत्मकथा में लिखा है, "हमारी सफलता का समाचार जानबूझ कर विलंब से दिया गया। उसे दो जून, ताजपोशी के दिन, ब्रिटेन में प्रसारित किया जाना था।" एवरेस्ट विजय का समाचार एक गोपनीय संदेश के जरिये भेजा गया था। पर्वतारोहण दल के नेता कर्नल हंट ने एक धावक को नामचे बाजार भेजा। वहाँ से वह बेतार के जरिए नेपाल में ब्रिटिश राजदूत को भेजा गया।

ब्रिटिश राजदूत ने यह समाचार गुप्त रखा। यहाँ तक कि नेपाल-नरेश को भी नहीं बताया। इसके बाद एक और विवाद उत्पन्न हुआ। यह तेनजिंग की नागरिकता को लेकर था। नेपाल के अखबार उन्हें अपना नागरिक घोषित कर रहे थे। भारतीय अखबार उन्हें "भारतीय" बता रहे थे।

इन सब बातों से तेनजिंग परेशान भी हुए। वे एक सीधे-सादे इन्सान थे। उन्होंने सादगी से कहा, "मैं नेपाल में जन्मा। भारत में पला बढ़ा।"

हमारी राय में यह विवाद व्यर्थ था। तेनजिंग की विजय किसी व्यक्ति, किसी देश की नहीं थी। यह मनुष्य मात्र के साहस की विजय थी।

इसी बीच एक और विवाद छिड़ा। एवरेस्ट पर पहले कौन पहुँचा?

हिलेरी या तेनजिंग?

यह विवाद भी व्यर्थ था।

एवरेस्ट-विजय एक दल के प्रयत्नों की विजय थी इसमें सबका योगदान था। किसी का कम, किसी का ज्यादा।

पर एक बात अवश्य थी। तेनजिंग की विजय से साधारण आदमी बेहद खुश था। उसे लगता था, जैसे तेनजिंग नहीं वह स्वयं एवरेस्ट पर चढ़ा है।

क्यों?

इसलिए कि तेनजिंग पहले एक साधारण शेरपा थे। उन्हें कोई जानता तक न था। एडमंड हिलेरी, कर्नल हंट प्रशिक्षित पर्वतारोही थे। तेनजिंग तो साधारण आदमी थे। इसलिए उनकी सफलता से साधारण से साधारण व्यक्ति तक प्रसन्न था।

तेनजिंग अब देश के लाड़ले "हीरो" थे। लोग दिल खोलकर उनका स्वागत कर रहे थे। वे तेनजिंग की सहायता भी करना चाहते थे। अखबारों में उनकी सहायता के लिए अपील निकाली गई। एक अखबार ने उनके लिए नया मकान बनाने की पेशकश की। लोहा, लकड़ी, सीमेंट, ईंट देने का वायदा किया। एक अखबार ने उनके लिए धनराशि भी एकत्र की। तेनजिंग परेशान हो गये। वे पंडित नेहरू का पिता की तरह आदर करते थे। उन्होंने उनसे सलाह ली।

पंडित जी ने कहा, "देखो तेनजिंग। लोगों ने तुम्हारे लिए धन एकत्र किया, यह अच्छी बात है। उन्होंने इस तरह तुम्हारे प्रति अपना प्रेम प्रदर्शित किया है। निस्संदेह, वे सब तुम्हारे प्रति आभारी हैं। पर इस तरह एकत्र किया गया धन दान होता है। मान लो, इस धन से तुमने एक मकान बनवाया। पर जब तुम वृद्ध हो जाओगे, तब लोग यह कहने में नहीं हिचकिचाएंगे कि तुम्हारा मकान जनता के चंदे से बना है। तुम यह बात पसंद नहीं करोगे। तुम्हारे पास तो घर है ही। तुम उसी की मरम्मत क्यों नहीं करा लेते। उसे ही सुंदर बना लो। यह धन स्वीकार मत करो।

कितनी अच्छी सलाह थी यह।

तेनजिंग ने उसे मान लिया प्रतीक रूप में थोड़ा सा धन लेकर सारा पैसा शेरपाओं के कल्याण के लिए एक ट्रस्ट को दे दिया। तेनजिंग शेरपाओं के लिए बहुत कुछ करना चाहते थे। वे स्वयं शेरपा थे। शेरपाओं की जिंदगी के कष्टों को वे भली-भांति जानते थे।

प्रेरणा के स्रोत

तेनजिंग सरल थे, साहसी थे, छल-प्रपंच से दूर थे। बचपन में उन्होंने एक सपना देखा था। पर वे केवल सपना देखकर ही संतुष्ट नहीं हो गए। उन्होंने उसे साकार करने का प्रयत्न किया। सोलो-खुम्बू-क्या हम इस स्थान का नाम भी जान पाते? तेनजिंग ने अपनी सफलता से अपनी जन्मभूमि का गौरव बढ़ाया। पर तब शायद कोई विश्वास भी नहीं करता कि सोलो-खुम्बू का यह किशोर एक दिन एक नया इतिहास रचेगा। सबकी प्रेरणा का स्रोत बनेगा।

तेनजिंग की जीवनी पढ़ते हुए मैं रोमांचित होता रहा। उन्होंने कितने कष्ट झेले। कितनी बाधाओं का सामना किया। पर वे निराश नहीं हुए। वे एवरेस्ट पर चढ़ना चाहते थे। यह उनकी बचपन की आकांक्षा थी। यह 37वें वर्ष में जाकर पूरी हुई। कोई और होता तो दुनियादारी में उलझ जाता। पर्वतारोहण के खतरों से भयभीत हो जाता। अपना सपना बिसार देता।

एक उक्ति है–

"जहाँ चाह वहाँ राह।"

"व्हेयर देयर इज़ विल, देयर इज़ वे।"

तेनजिंग की जीवनी बार-बार मुझे इस उक्ति की सत्यता की याद दिलाती रही।

तेनजिंग हमारे बीच नहीं है। पर वे अमर हैं। एवरेस्ट के साथ उनका नाम सदैव जुड़ा रहेगा। उस एवरेस्ट के साथ, जिसे वे चोमो-लुंगमा के नाम से जानते थे। जिसका वे आदर करते थे।

जिसके प्रति उनके मन में पूजा का भाव था।

एक प्रसंग याद आ रहा है। तेनजिंग के भतीजे गोम्बू ने सन् 1965 में एवरेस्ट के शिखर पर चढ़ाई की थी। गोम्बू सन् 1963 में पहले भी शिखर तक हो आए थे। सन् 1965 में वे भारतीय दल के साथ थे। जब गोम्बू अभियान पर रवाना हुए तो तेनजिंग ने उन्हें बुद्ध की एक मूर्ति भेंट की। कहा, शिखर पर उसे बर्फ के मध्य रख देना।

गोम्बू ने ऐसा किया भी।

इस प्रसंग से पता चलता है कि तेनजिंग कितने धार्मिक थे। पर वे रूढिवादी नहीं थे। वे सभी धर्मों का आदर करते थे।

तेनजिंग को प्रसिद्धि घमंडी नहीं बना सकी। न उन्होंने अपनी जन्मभूमि को भुलाया। वे सोलो-खुम्बू को बेहद चाहते थे। उनकी एक इच्छा थी। सोलो-खुम्बू में लुकला के पास एक पर्वतारोहण स्कूल खोला जाए। आज वहाँ एक हवाई पट्टी है। एवरेस्ट के आधार शिविर से यह चार दिनों का रास्ता है। तेनजिंग का ख्याल था कि ऐसा स्कूल बहुत उपयोगी होगा। अब एवरेस्ट अविजित नहीं है। अनेक देशों के लोग शिखर तक पहुँच चुके हैं। फिर भी एवरेस्ट का आकर्षण अभी भी बना हुआ है। तेनजिंग चाहते थे कि सोलो-खुम्बू में एक स्कूल खुले ताकि अपनी जन्मभूमि में रह सकें। अपनी जन्मभूमि के लोगों के प्रति कुछ कर सकें।

अपने देश में तीन प्रकार के ऋण सबसे महत्वपूर्ण माने गए हैं। जीवन में मनुष्य को उन्हें उतारने का प्रयत्न करना चाहिए।

ये हैं – देव ऋण, ऋषि ऋण

और समाज ऋण।

तेनजिग समाज–ऋण को उतारना चाहते थे।

हम सब पर समाज का बहुत बड़ा ऋण होता है। समाज जीवन में हमें बहुत कुछ देता है। इसीलिए हमें भी समाज को कुछ

देना चाहिए। उसकी सेवा कर, अच्छे नागरिक बन, मनुष्यता का नाम ऊँचा कर, हम यह ऋण उतार सकते हैं।

तेनजिंग ने यही किया।

उनकी जीवनी भी हमें यही प्रेरणा देती है।

वापसी: माँ की नसीहत

नीचे के शिविरों में लोग उनकी प्रतिक्षा कर रहे थे। वे सब उनकी सफलता से खुश थे।

चौथे नम्बर के शिविरों में तेनजिंग ने साथियों सहित रात बिताई। वहाँ उनके एक साथी ने चिट्ठी लिखी। यह चिट्ठी तेनजिग की ओर से थी। उनकी पत्नी के नाम। तेनजिग ने चिट्ठी पर दस्तखत किए। लिखा – ''यह पत्र तेनजिग की ओर से है। 28 मई को मैं और एक साहब एवरेस्ट शिखर पर पहुँच गए। आशा है, तुम प्रसन्न ही होगी। ज्यादा नहीं लिख सकता।''

अगले दिन वे सब आधार-शिविर पहुँचे। आधार शिविर यानी बेस कैंप। वहाँ भी खुशी का वातावरण था। तेनजिग प्रसन्न भी थे और बेचैन भी। वे अपने गाँव थामे जाना चाहते थे। वहाँ उनकी माँ थी। परिवार के सदस्य थे। थामे वहाँ से पैंतीस मील दूर था। तेनजिग थके हुए थे। पर मन में माँ से मिलने का उत्साह था। वे चल पड़े।

थामे में वे माँ से मिलें, बहन से मिले। परिवार के सदस्यों से भेंट की। तेनजिग ने माँ को अपनी सफलता के बारे में बताया। वे बहुत खुश हुईं। फिर माँ ने बेटे को एक नसीहत दी। ''मेंने कई बार तुमसे कहा, उस पर्वत पर मत जाना। पर तुम नहीं माने। अच्छा, अब दुबारा मत जाना।''

तेनजिग की माँ बचपन से एक बात सुनती आई थी। उनका विश्वास था – एवरेस्ट पर सोने की मैना रहती है। मणियों से जड़ा, सोने की अयालवाला एक सिंह भी वहाँ है।

उन्होंने बेटे से उनके बारे में पूछा।

उत्तर मिला –

"वहाँ न सोने की मैना थी, न सोने की अयालवाला सिह।"

माँ ने फिर पूछा, "क्या वहाँ से रोंगबुक मठ दिखाई देता था।"

"हाँ, वह दिखाई देता है।"

तेनजिंग दो दिन अपनी माँ के पास रहे। वे चाहते थे कि माँ भी उनके साथ दार्जिलिंग चले। उनकी माँ थामे में ही रहना चाहती थी। वे बोली, "मैं चलना तो चाहती थी पर अब बहुत बूढ़ी हो गई हूँ। तुम्हें कष्ट ही दूँगी।"

तेनजिंग ने गाँव से पोर्टर एकत्र किए। फिर उनके साथ धागबोचे की ओर चल पड़े। वहाँ पर्वतारोहण दल के सदस्यों को पोर्टरों की जरूरत थी। राह में तेनजिंग अपनी बहन से भी मिले।

अब उनकी वापसी की यात्रा शुरू हुई। पहले नामचे बाजार, फिर काठमांडू।

काठमांडू से तीन मील पहले तेनजिंग की पत्नी और बेटियाँ उनकी राह देख रही थीं। तेनजिंग उनसे मिलकर बहुत खुश हुए।

काठमांडू में तेनजिंग ओर उनके साथियों का भव्य स्वागत हुआ। तेनजिंग का जन्म नेपाल में हुआ था। नेपाली जनता बहुत खुश थी। उसे तेनजिंग पर गर्व था। नेपाल नरेश श्री त्रिभुवन ने तेनजिंग को राजभवन में निमंत्रित किया। उन्हें "नेपाल-तारा" पदक पहनाया। यह नेपाल का सर्वोच्च सम्मान था।

स्वागत-सत्कार – "तेनजिंग जिंदाबाद"

काठमांडू से तेनजिंग कलकत्ता रवाना हुए। उनके साथ उनका परिवार भी था। नेपाल-नरेश श्री त्रिभुवन ने अपना निजी विमान इस यात्रा के लिए दिया था।

डमडम : कलकत्ता का विमानतल। अपार भीड़ सबकी जबान पर एक ही नारा – "तेनजिंग जिंदाबाद!"

कलकत्ता में तेनजिंग राजकीय अतिथि रहे। उसके बाद दिल्ली रवाना हुए।

दिल्ली में भी उनका भव्य स्वागत हुआ।

तब पंडित जवाहरलाल नेहरू प्रधानमंत्री थे। उन्होंने पर्वतारोहियों के सम्मान में स्वागत-समारोह आयोजित किया।

तेनजिंग के लिए यह महान क्षण था। कभी न भुलाया जा सकने वाला क्षण।

तेनजिंग ने लिखा है–

"पंडित जी मेरे लिए पिता के समान थे। दयालु, उदार, आत्मीयता से भरे। औरों की भाँति मेरा उपयोग नहीं करना चाहते थे। बल्कि वे सोचते थे कि मैं खुश रहूँ।

स्वागत-समारोह के बाद पंडित जी ने तेनजिंग को अपने कार्यालय में बुलवाया। उन्होंने उन्हें लंदन जाने की सलाह दी। यही नहीं, उनकी पत्नी और बेटी की लंदन-यात्रा की भी व्यवस्था करवा दी।

वे तेनजिंग को अपने निवास-स्थान भी ले गए। वहाँ उन्होंने अपने वस्त्रों की अलमारी खोल दी। तेनजिंग को शेरवानी दी, पाजामा दिया, कमीजें दीं। उन्होंने अपने पिता स्व. मोतीलाल नेहरू की भी कुछ चीजें तेनजिंग को दीं। उन्होंने उनकी पत्नी अंग लहमू को एक सुंदर-सी नोटबुक दी। एक बरसाती भी दी। कहा, "लंदन में बरसात होती है।"

पंडित जी ने तेनजिंग को बहुत-सी चीजें दीं, पर गाँधी-टोपी नहीं दी। क्यों? वे जानते थे कि इस भेंट के कई अर्थ लगाए जाएँगे। उन्होंने तेनजिंग को राजनीति से भी दूर रहने की सलाह दी।

रोम, ज्युरिख और फिर लंदन।

लंदन में भी तेनजिंग का स्वागत किया गया। वहाँ वे कई दिन रहे। फिर वे स्विटजरलैंड गए। वहाँ उन्होंने प्रसिद्ध आल्प्स पर्वत पर भी चढ़ाई की।

एक दिन फिर वे फिर से भारत में थे। नई दिल्ली में तत्कालीन राष्ट्रपति डा. राजेन्द्र प्रसाद ने उन्हें बुलाया। उनके अनुभव सुने। फिर भविष्य के लिए कुछ सलाह भी दी। तेनजिंग नेहरू जी से भी मिले।

फिर वे दार्जिलिंग लौट आए। अपने घर पर। अब वे न शेरपा थे, न "टाइगर"। वे थे एवरेस्ट विजेता।

तुम हजारों तेनजिंग बनाओगे

एवरेस्ट – विजय।

मनुष्य की एक आकांक्षा की पूर्ति।

मनुष्य का स्वभाव है कि वह नई-नई चुनौतियाँ स्वीकार करता है। उन्हें पूरा करने के लिए खतरों से जूझता है। उसकी सफलता सबके लिए प्रेरणा का स्रोत बनती है।

तेनजिंग की सफलता भी देशके लिए प्रेरणा का स्रोत बनी।

उन दिनों पश्चिमी बंगाल के मुख्यमंत्री थे डा. विधानचंद्र राय। वे चाहते थे कि दार्जिलिंग में एक केन्द्र खोला जाए। वहाँ भारतीय युवकों को पर्वतारोहण का प्रशिक्षण दिया जाए। उन्होंने तेनजिंग की राय ली। पंडित नेहरू से बात की। पंडित नेहरू का ख्याल था, शायद छात्र नहीं मिलेंगे। पर डा. राय को विश्वास था। आखिर एक पर्वतारोहण केन्द्र की स्थापना का निर्णय कर ही लिया गया।

चार नवम्बर 1954!

पं. नेहरू ने हिमालयन माउंटेनियरिंग इन्स्टीट्यूट का उद्घाटन किया। मेजर दयाल उसके प्रिंसीपल नियुक्त हुए।

तेनजिंग को उसका निदेशक बनाया गया।

पंडित नेहरू ने एक बार तेनजिंग से कहा था — "हम लोग हिमालयन माउंटेनियरिंग इंस्टीट्यूट खोलेंगे तुम्हारे जिम्मे प्रशिक्षण का काम होगा। तुमने संसार के सबसे ऊँचे पर्वत पर चढ़ाई की है। तुम्हारा नाम तेनजिंग है। अब तुम हजारों तेनजिंग बनाओगे। जितने ज्यादा लोगों को प्रशिक्षण दे सकते हो, दो।"

तेनजिंग को पंडित नेहरू की यह बात सदा याद रही। उन्होंने मन लगाकर छात्रों को पर्वतारोहण की शिक्षा दी। पर उसके पहले उन्होंने स्वयं प्रशिक्षण लिया। स्विटजरलैंड में रोजेनलाउई नामक एक स्थान है। वहाँ पर्वतारोहण के प्रशिक्षण का एक स्कूल है। तेनजिंग ने यहीं प्रशिक्षण लिया। फिर उन्होंने मांट ब्लेंक पर्वत शृंखला में एक झील के पास एक गाँव में गाइड का कोर्स किया। इस गाँव का नाम है — चॉपेक्स।

प्रशिक्षण पूरा कर वे दार्जिलिंग लौट आए। इसके बाद वे निदेशक बने। इस केन्द्र में आज भी छात्र पर्वतारोहण की शिक्षा पाते हैं। इस केंद्र में प्रशिक्षण पाए छात्रों ने भी एवरेस्ट पर विजय पाई है।

सन् 1965 में एक भारतीय दल एवरेस्ट पर गया था। इस दल के नौ सदस्यों ने शिखर पर चढ़ने में सफलता पाई थी। इनमें से आठ सदस्यों ने हिमालयन माउंटेनियरिंग इंस्टीट्यूट में प्रशिक्षण पाया था। उनकी सफलता में तेनजिंग का भी योगदान था। वे प्रत्येक छात्र की समस्या सुनते थे, उन्हें सुलझाते थे।

सद्भावना के राजदूत

तेनजिंग हिमालयन माउंटेनियरिंग इंस्टीट्यूट के निदेशक तो थे ही, वे देश के सद्भावना के राजदूत भी थे।

भारत सरकार के निमंत्रण पर उन्होंने अनेक देशों की

यात्राएँ कीं। वे अमरीका भी गए और रूस भी। फिर वे आस्ट्रेलिया, सिंगापुर और यूरोप भी गए। उन यात्राओं में वे लोगों को अपने अनुभव सुनाते। यह काम उन्होंने अपने देश में भी किया।

एवरेस्ट विजय के बाद उन्होंने भारत के अनेक नगरों का दौरा किया। लेक्चर दिए। पर्वतों के प्रति लोगों का प्यार जगाया। विदेशों में भी उन्होंने यही किया। वहाँ भी अवसर मिलने पर वे पर्वतों पर चढ़ाई करते।

इसी बीच उन्होंने तीसरी बार विवाह किया। पहली पत्नी के निधन के बाद उन्होंने दूसरा विवाह किया था। उनके पुत्रियाँ ही थीं। अतः उनकी पत्नी ने उनसे एक और विवाह करने को कहा। उनकी तीसरी पत्नी का नाम दखा फुटी है। उनसे तेनजिंग को पुत्र हुए। अमरीका-यात्रा में दखाफुटी भी तेनजिंग के साथ थीं। उन्होंने भी पर्वतों पर चढ़ाई की। तेनजिंग जहाँ जाते, एवरेस्ट-विजेता के रूप में उनका आदर किया जाता। सम्मान दिया जाता।

हिमालयन माउंटेनियरिंग इन्स्टीट्यूट में तेनजिंग ने अनेक वर्षों तक कार्य किया। सरकारी नियमों केकारण उन्हें आयु होने पर निदेशक पद से सेवा-निवृत होना पड़ा। लेकिन सरकार उनके अनुभव का लाभ उठाना चाहती थी। उसने उन्हें इंस्टीट्यूट का सलाहकार बना दिया। इस पद पर वे अंत तक कार्य करते रहे।

निरंतर यात्रा, निरंतर कार्य, उधर बढ़ती उम्र! तेनजिंग का स्वास्थ्य धीरे-धीरे बिगड़ने लगा।

1986 में वे दार्जिलिंग से नई दिल्ली आए थे। यहाँ आल इंडिया मेडिकल इन्स्टीट्यूट में उनकी चिकित्सा की गई। तब हमने अखबारों में उनका चित्र देखा था। हमने उनकी युवावस्था के चित्र भी देखे थे। अब वे बूढ़े हो चुके थे, पर उनकी आँखों में

वही चमक थी। स्वस्थ होकर वे दार्जिलिंग लौट गए।

8 मई 1986 को सारे देश ने एक दुखद समाचार सुना।

एवरेस्ट विजेता तेनजिंग नहीं रहे।

उनके निधन से सबको बेहद दु:ख हुआ। वे व्यक्ति नहीं, संस्था थे। राष्ट्रपति, प्रधानमंत्री तथा अनेक नेताओं ने उनके निधन पर गहरा शोक व्यक्त किया।

तेनजिंग बौद्ध धर्म को मानते थे। उसी के अनुरूप उनकी अंत्येष्टि की गई।

14 मई 1986

प्रात: साढ़े आठ बजे उनकी शवयात्रा निकली। उसमें हजारों लोग शामिल हुए। सर एडमंड हिलेरी भी पहुँचे। ठीक साढ़े बारह बजे तेनजिंग की चिता को अग्नि दी गई। लोगों की आखें भर आईं। एक युग का अंत हो गया।

The fore-edge and tail of most books are usually left ungilded. This is probably due to the fact that there is no need, for a utilitarian purpose, to gild other than the edges on the head of a book. Table books, such as guest books, have all their edges exposed and are therefore better "gilt all round" or "full gilt." Likewise, very sumptuously bound books with all-over gold tooling, silk doublures, and other elegant features seem to call for "full-gilt" edges

OUTFIT FOR EDGE-GILDING The outfit and materials necessary for edge-gilding consist of a heavy lying press (Fig. 1), a pair of gilding boards (Fig. 53); a steel scraper, such as is used by

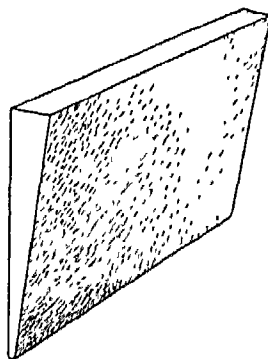



Fig 53

cabinetmakers, or a few pieces of broken heavy glass; a flat bloodstone or agate burnisher and a "tooth" burnisher (Fig. 54 A and B); a fairly stiff ordinary nailbrush; and a gold cushion and knife (Fig 55 A), with a shield (Fig. 55 B) placed around the cushion. The shield is made of corrugated paper, cut and bent into shape and bound with artist's tape. A gilder's tip (Fig. 56), a book of gold leaf, a jar of glaire, a sizable camel's-hair glaire brush, a pot of "Armenian bole," a small sponge, some French chalk, a piece of beeswax, a few pieces of very fine sandpaper, and some unprinted newspaper will all be necessary for the worker.

Fig. 54 A.

Fig. 54 B

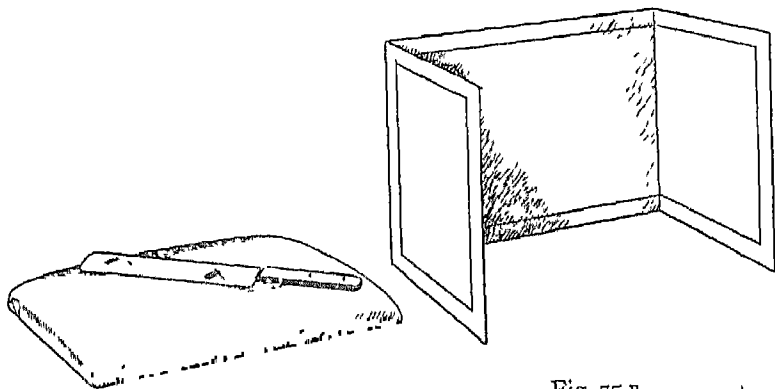



Fig. 55 A

Fig. 55 B

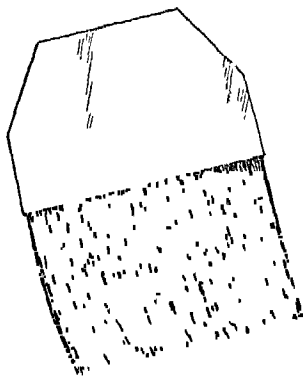



Fig. 56.

Gilding boards are best made of beechwood. They are of various lengths, according to the size of the book on which they are to be used, and they are beveled from a thickness of about three-eighths or one-half inch to one-eighth of an inch.

Almost every edge-gilder has his own special formula for making glaire, and any formula is good if it can be "wormed out" of the gilder. I have found the following one satisfactory. Break a fresh egg, separating the white from the yolk. Measure the white, and to it add four times as much water as there is egg white. Beat this mixture up with an egg beater and let it stand overnight. Then strain it through a piece of fine muslin, and it is ready for use, but when not in use it should always be kept tightly covered. Glaire acts as an adhesive and makes the gold stick to the edge.

A gold cushion and knife can be bought at any binder's supply house, likewise a gilder's tip "Armenian bole" is procured from a chemist and is a kind of powdered red chalk. To prepare it for gilding, it is mixed with water until it becomes a rather thick paste Some gilders use black lead with the bole, but I have not found this necessary.

Edge-gilding should be done in a room free from dust and drafts of air. Dust spoils the gilding, and even a slight breeze makes the handling of gold leaf troublesome. Before the edges of a book are gilded, the type of paper used for the text should be noted. If it is clay-filled glazed paper such as that known to the trade as "art mat," it will need to be French chalked in order to prevent the edges from sticking together by the penetration of the glaire. Books printed on thin India paper should also be chalked. Chalking is done by fanning out the edges slightly and dusting on the powdered chalk.

Edge-gilding Before Sewing. To gild the head of a book before sewing, the book is knocked up at the head between two gilding boards until all the sections are even with the edges of the

boards. Then it is lowered into the lying press until the gilding boards are almost flush with the cheeks of the press (Fig. 57), and the press is screwed up evenly and as tightly as possible.

Next, the edge is scraped either with a steel scraper having a slight burr on it or with a piece of heavy glass The scraping of the head should be done from the back toward the fore-edge, for otherwise the sections may be broken at the fold. When scraped evenly, the edge is rubbed off with a very fine sandpaper in order to remove any chance stains. The scraper must be sharpened on a piece of steel harder than itself. To do this, the scraper is laid on

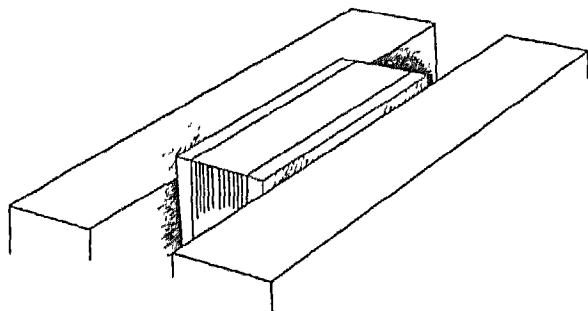



Fig. 57.

an edge of a table, with the end to be sharpened projecting beyond the table. The sharpening steel is rubbed vigorously over one side of the scraper with a downward motion Then the scraper is turned over, and the other side of it is rubbed against the sharpener. To put a burr on the scraper, the hard steel is held against a table, and the blade edge of the scraper is rubbed over it while the scraper is held at right angles to the sharpening steel.

A thin coat of bole is applied with a small sponge to the book-edge in order to seal it, and the edge, after it is dry, is brushed vigorously with a nail brush until it has a high polish. The bole must not be used so thin that it will penetrate the leaves of the book. If the book paper is soft-finished, it should have a coat of

size made of vellum scrapings or gelatin before the bole is applied (See Chapter XX for making size). Any preparation applied to the edge must be allowed to dry thoroughly before glairing for the laying of gold leaf.

On the gold cushion, a sheet of gold leaf is laid out (see instructions under "Gold Tooling") and is cut into strips sufficiently wide to cover the width of the edge to be gilded Then, with the large glaire brush, a generous coating of glaire is applied to the edge. The glaire is floated on with strokes of the brush from one end of the edge to the other, and any bubbles that appear are brushed out. When the glaire is free of bubbles, a strip of gold is taken up with the gilders' tip, simply by laying the end of the tip on the edge of the gold leaf, and the gold leaf is laid lightly on the glaired edge. If any holes or cracks appear, one end of the press is picked up and the glaire is let to run over these places, after which a patch of gold leaf is put on them. When the gold is all laid on, the press is tipped to allow the glaire under the gold to run from one end to the other and from side to side This is to make sure that the gold is drawn down tightly to the edge, for wherever the glaire runs it will pull the gold down and cause it to adhere to the edge. Now the press is turned up on its side to drain off any excess glaire (Fig. 58), and after the glaire ceases running off from under the gold, the press is laid flat and the edge is let to stay in this position until it is dry. The amount of time necessary for drying varies from a half hour to an hour, depending upon the quality of the paper and the temperature of the room. It is best to do edge-gilding in a warm room.

Just when an edge is ready to burnish can be determined accurately only after some experience. When a bright gilt edge is desired, a useful way of testing for dryness is to breathe on the edge If the vaporous cloudiness produced on the gold by breathing on it disappears quickly, the edge is ready for burnishing. The edge must not be too dry, for then it will not polish bril-

liantly. If the edge is too damp, the gold will rub off. When it seems to be ready, some beeswax is rubbed on a piece of thin paper, and with the waxed side up, the paper is laid on the edge and a burnisher is gently run crosswise over the paper. This sets the gold if it is ready for burnishing, but if the gold seems to smear or rub, the gilder must stop burnishing and wait for the

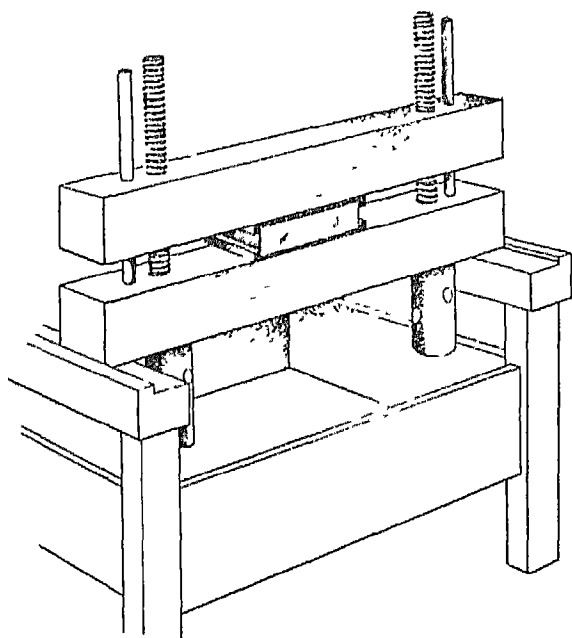



Fig. 58.

work to dry. When finally ready to be burnished, the edge is lightly rubbed lengthwise with a soft pad that has been well rubbed over with beeswax. Then the burnisher is gently rubbed across the edge, and the pressure is gradually increased until finally, with the burnisher handle in the pit of the arm and both hands on the handle, as much pressure as possible is used. The burnisher must be held squarely or it will leave marks on the edge. After the burnishing is done across the edge from one di-

rection, it is done from the opposite direction. The edge must never be burnished lengthwise directly on the gold. Occasionally in burnishing, the edge is waxed in order to permit the burnisher to work easily.

After the edge is burnished, if there should be a break in the gold on a spot that is not well covered, spirits of wine is applied to the place with a brush, and a piece of gold is laid over the imperfect edge. Then almost immediately a thin piece of paper is put over the patch, and the edge is lightly burnished. The paper is removed, and the spot or crack is burnished so that it merges with the rest of the gilded edge. If the patching is unsatisfactory, spirits of wine is applied to the whole edge, it is then glaired again, and the gilding process is repeated. If chalk has been used on the edge before gilding, the edge should be tapped lightly on the cheek of the press to remove the chalk. Edges may be either bright gilt or dull gilt. If a dull finish is desired, the edge should be let to dry for a longer time than when a bright gilt is to be produced. For this dull finish, the edge is burnished with a paper over it, and the burnisher should not be used directly on the surface of the gold leaf.

To gild the tail and fore-edge of a book before sewing, the same procedure is followed as for the head. If the edges are very irregular, they may need to be interleaved before gilding, in order to produce a firm enough surface to take the gold evenly. In such case, the pages must be carefully interleaved with a fairly hard-sized paper, so that when the edge is knocked up for gilding, it will be as solid as possible. This sort of edge-gilding requires much patience and experience and should not be attempted by an amateur worker on a book of any value until he has practiced on dummies or on worthless books.

Coloring Head Before Sewing. A simple way to finish the edge on the head of a book is to color it. This is not suitable

for books bound in full leather or for books of much value, but the head of a current novel or of some reference book or pamphlet may be finished in this manner.

Higgins' inks, "show card colors" mixed with water with a little size in it, or powdered colors mixed with a thin size or with thin paste may be used for coloring edges. The color is mixed in a shallow dish, and the book is put in the lying press as for gilding. The edge is scraped smooth and is finished off with fine sandpaper. The color is applied sparingly from the back to the fore-edge with a large soft brush or a small sponge. When dry, the edge is burnished vigorously with a stiff nailbrush. Then a waxed cloth is rubbed over it, and it is burnished with the agate or bloodstone burnisher crosswise as for gilding

The head of a book and the other edges cut with the plough may be sprinkled instead of being finished with an even color. This is done by brushing a color through a wire screen. Another color may be brushed on after the first color. When dry, the edges are burnished like other colored edges.

CHAPTER VIII

FORWARDING

Cover Boards Cutting Boards and Lining Up. Marking Book for Sewing

COVER BOARDS

IN Vol. I, p. 63, will be found some information about the early use of coverboards. In recent years various kinds of composition boards have been manufactured for the use of the hand binder. At the present time there are three varieties of this type of board suitable for using as book covers. The most superior bookboard is the English "millboard," which is made of rope or old cordage. It does not warp easily and will stand a great deal of abuse. It is manufactured in several thicknesses and is usually used by the hand binder in sheets 19 x 24 inches in size A French bookboard called "carton bleu" is also a very sturdy board. Like millboard, it is manufactured in a number of thicknesses but usually in somewhat larger sheets than millboard Both of these boards have been unprocurable in this country for several years, and the hand binder whose stock of them is exhausted has had to use an inferior American-made board as a substitute. The American bookboard is manufactured out of wastepaper pulp and other fibrous materials. It is made in various sizes and thicknesses and is sold under trade names. In "the trade" it is sometimes referred to as "cloth board." Boards of American manufacture are liable to warp unduly and to bend or break more easily at the corners than those of English or French make, though recently a board of better quality has been produced in America than those made in the past.

CUTTING OUT BOARDS

The size and thickness of a book should be taken into consid-

eration in selecting the thickness of the board to be used Thin boards are less clumsy than thick ones, and I think they should be used more frequently than is the present custom. The domestic board, of a size 20 x 30 inches, is most economical to use for octavo books. For a single volume, two boards are cut out about three-quarters of an inch wider and one inch longer than the book, to allow for trimming in the cutter. The length of the boards should run along the width of the board sheet. If no cutter is at hand, a pair of bench shears as shown in Fig. 8 may be used for getting out the boards roughly. In this case the boards should be cut amply large, for they will not be square. However, any bindery should be equipped with some sort of cutting machine, for otherwise cutting cannot be done efficiently and without great waste of time It is the practice in even the smallest binderies to cut up at least one whole board at a time. The board is cut into eight parts for octavo books, and after these are lined up, they are kept under a weight to "season." A stock of well-seasoned boards should always be kept on hand, and not less than a few weeks should be allowed for the seasoning process. If freshly lined-up boards are used on books, they are sure to warp badly unless the book is kept constantly under pressure. Since most books are not likely to be kept under pressure, it is safer to season the boards some time before they are needed

LINING UP BOARDS

It is customary on all extra work to line up both sides of the cover boards with paper before attaching them to the book in order to prevent the color of the boards from showing through the end papers and also to give the boards a surface which will take the paste evenly in covering and in pasting back the end papers.

When any material is pasted on only one side of a board, the board will warp and curl over toward the side on which the ma-

terial has been pasted. Hence, when a leather cover is pasted over the boards on the outside, it will warp them outward. To counteract this warping which will take place after covering, boards are always lined up with an extra piece of paper on the inside. Therefore two pieces of paper are pasted on the inside, and one piece on the outside, when they are being lined up

A suitable kind of lining paper for boards is unprinted newspaper This is the sort of paper used for newspaper printing. It is almost entirely unsized and is hence quite porous. A medium quality is strong enough for lining-up work, and it may be purchased by the bundle from paper houses specializing in the cheaper grades of paper

To line up a batch of boards after they have been cut, three pieces of paper are cut for each board one-quarter of an inch larger than the board all round. To do this efficiently three full sheets of newspaper are counted out and each is laid evenly on top of the other. The cutter is set to the width or length desired, and the three sheets at a time are cut through until their whole length is cut up These cut sheets are piled evenly on each other, the cutter is set to the second measurement desired, and all the sheets are cut to this measure.

Now the cut boards and the lining papers are placed on the workbench in piles. A bowl of commercial paste is mixed up and beaten free of lumps, and it is thinned down with water until it is the thickness of thin milk Paste for lining up boards is used thinner than for any other job in bookbinding, because the thinner the paste the less drag there will be when it is applied, and drag tends to stretch the paper and warp the boards After the paste is mixed, two wooden pressing boards and four covered tins of the same size are laid out. These should be large enough to cover the cut bookboards. They are put on the table next to the nipping press. Then to paste on, a supply of printed newspaper is cut generously larger than the cut lining paper, and this is put in

a pile on the workbench Three pieces of cut lining paper are counted out and are placed one on top of the other on the pasting paper, and then the worker is ready to line up the first board. Simple as pasting appears, it requires a little practice before one is able to do it expeditiously and neatly, and a good thing to practice on is lining-up boards, for an occasional lining paper spoiled by a wrong stroke of the brush is not too serious a matter.

The paste brush is grasped in the hand as described for guarding A small amount of paste at a time is taken up, and the worker begins spreading the paste at the right end of the paper with quick, light, overlapping strokes directed from left to right, while holding the paper with the left hand so that it will not slip. The holding hand should be kept fairly close to where the paste is being spread, and it is gradually moved along to the left as the pasting progresses. When the left end of the paper is nearly reached, the holding hand is removed and the pasting is finished with a few light strokes toward the left end of the paper. (These directions should be reversed for a left-handed person.) The paper is lightly folded over, without creasing, so that the pasted sides are inward, and it is placed on the left side of the work. Without changing the pasting paper, first one and then the other of the three pieces of paper are pasted in like manner and are folded over, one being placed on top of the other. The used pasting paper is discarded, and one of the cut boards is placed on a clean pasting paper The pile of folded pasted papers is turned over so that the first one pasted will be on top. The top one is unfolded, is spread over the board, and is smoothed out with the palm of the hand. A second pasted paper is unfolded, is spread over the first one, and is smoothed out with the hand. It is marked lightly in the center with a cross or a letter to indicate the side with two lining papers. The board is turned over; the third paper is spread on it and is smoothed out with the hand The papers must not be smoothed with a folder, as there is danger of

tearing an unsized paper. Now the overhanging edges of the papers are trimmed off with the shears, and the lined-up board is taken over to the nipping press. It is placed between two tins and two pressing boards and is nipped for an instant in the press. It is then stood up to dry in some place where it can rest against the wall or some other surface perpendicular to the standing surface, and the marked side is placed outward This process is repeated with the next board, the used covered tins being changed for fresh ones in pressing This board is stood up beside the first one with its marked side out, and the first board is turned around in order to expose the unmarked side. After they are pasted and nipped in the press, one board after another is stood up in this manner, and the standing boards are turned as the new one is added so that both sides of the boards will be exposed to the air while drying and will dry evenly. The boards should be stood up as straight as possible and as they begin to curl and seem almost dry, they are piled on a workbench or table with a paring block as a weight. They should be left under this heavy weight for at least twenty-four hours, when they may be put aside with a lighter weight on them until they are needed.

If there are no lined boards in stock, boards should be lined up at an early stage in binding a book so that they will be dry when the book is ready to have its boards laced on, but if they are used soon after lining up, it must be remembered that they are not seasoned, and the book on which they are used must be kept under pressure while in work.

I have described this system of lining up boards in detail because much time may be needlessly consumed in this simple operation unless an efficient system is followed Boards can be cut out and lined up for a dozen books in an hour or less, though I have known amateur binders who take twice that time to line up boards for two or three books, because of lack of system.

MARKING BOOK FOR SEWING

Before being sewed, books must be marked up on the back to indicate the position of the cords or tapes around which the sections are to be sewed. When a book is sewed on cords, it should be sewed flexibly, that is, with the thread wrapped around each cord If the book is sewed on tapes, this cannot be done, and hence a book sewed on cords is stronger and less slippery than one sewed on tapes.

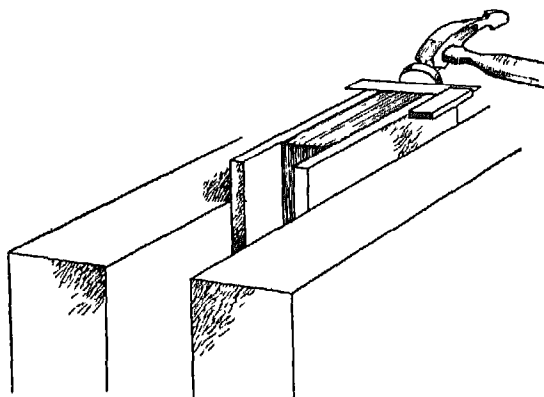



Fig. 59.

MARKING UP FOR CORDS. To mark up for cords, the book is knocked up at head and back between two old squared cover boards The folds of the sections should align evenly and the head should be squared to the back. Then with the boards on each side the book is lowered into the finishing press. It is placed at right angles to the worker and with the head away from him. The press is tightened, and the head is tested for squareness by means of a small try square. If the head is not perfectly square, the press is unscrewed slightly, and a large-faced backing hammer is used to tap the head of the book gently up to the try square until all the pages align with it (see Fig. 59). Then the press is screwed up, and with a pair of spring dividers the back of the book is measured

off into segments. The usual number of bands on a book is five, though on a thin large book six bands are sometimes used, and four bands are often used on small thick books. Each cord constitutes a band after the book is covered.

In marking up for five cords, the back is divided into six portions. Measuring from head to tail, the first five portions are equal, and the last one at the tail is somewhat longer than the other five. This is customary because if all six divisions were equal, the tail division, due to an optical illusion, would look shorter than the others when the book is standing on a shelf How much longer the tail division should be than the others is a matter of taste, but in my opinion it should not be exaggerately long — only just enough longer to overcome the appearance of being shorter. Something between one-eighth and one-quarter of an inch longer, depending upon the size and thickness of the book, should suffice When a book is to be cut in boards, allowance must be made for the amount to be cut off, for otherwise the head and tail divisions, after being cut off, will be too short.

After the position of the cords has been decided on, their places are indicated with the point of the dividers all down the back. Then, using a small try square as a guide for marking, in the manner it is used in Fig 59, a pencil mark is drawn through each point, making lines at right angles across the back of the book, so that the sewer may know where to place her cords when "stringing up" Two additional lines are now marked across the back with the aid of the try square, one about one-half inch down from the head and the other one-half inch up from the tail. These lines serve to indicate where the kettle or catch stitches are to go, and they must be sawed in across the back so as to sink the sewing thread as it catches or fastens one section to the other at each end of the book But before the sawing-in, the end papers are removed or pulled forward so that they will not be sawed through, for if they were sawed the holes would show at the

joint of the book after the end papers are pasted down on the boards To saw in the kettle stitch marks, a moulding saw is used, and a groove is sawed across the back only deep enough to sink the thread to be used for sewing (Fig. 60).

Marking Up for Tapes To mark up for tapes or for double bands, the procedure is the same as for marking up for cords, except that two marks are made for each band. To do this without

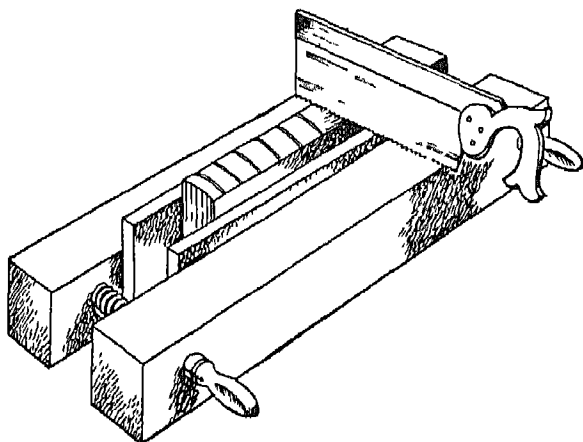



Fig 60

loss of time, the back is divided up into six equal parts for five bands. Then lines are marked across the back on the division points. The small dividers are set to the width of the tape or to the two cords to be sewed over, and this distance is marked above each division line. Lines are drawn through these marks and through the two kettle-stitch marks, and the latter are sawed The back will then be divided into five equal portions, with the tail portion as much longer than the others as the width of the tape or the double cord.

CHAPTER IX

SEWING

STRINGING UP FOR SEWING

AFTER a book has been marked up for sewing, it should be collated before the sewing operation is begun. Then the sewing frame must be "strung up." On every sewing frame in all hand binderies, there are five loops hanging from the cross bar. These are called "lay cords" (see Fig. 70), and the cords around which the sections are to be sewed are fastened to the lay cords with a knot, so made that by pulling the loose end it will untie. To make this knot, the index finger of the left had is put through

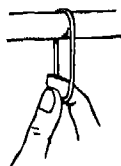



Fig. 61 I

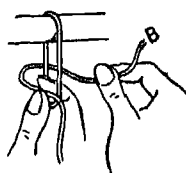



Fig 61 II.

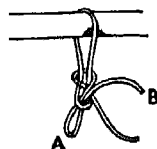



Fig 61 III.

the lay cord from the back, pointing toward the sewer when she is sitting in the position shown in Fig 70, and the left thumb is brought up to meet the finger (Fig. 61 I). Then with the right hand the end of the cord is brought up in front of the lay cord, is held between the finger and thumb, and is wrapped around the back of the lay cord (Fig. 61 II). With the forefinger of the right hand, the cord is stuffed under the left forefinger and thumb through the bottom loop of the lay cord (Fig 61 III), thus forming loop A of it, and with the free end B sticking up Loop A is pulled until the knot is tight If properly made, this knot can be untied simply by pulling end B

After the sewing cord has been thus fastened to the lay cord, it is secured under the bed of the sewing frame (Fig. 62). A brass

key (Fig. 63) serves for this purpose, and it is fastened to the sewing frame as follows. In order to determine the length of the cord necessary to reach from the lay cord to the bed of the sewing frame, the key is held in the right hand and the cord in the left

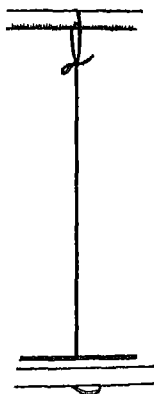



Fig. 62.

hand. The right side of the neck of the key (A) is placed against the cord and is brought along the cord until it reaches the bed of the sewing frame. Then, with the cord held firmly, the key is pushed under the bed of the sewing frame from the front

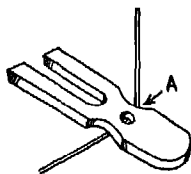



Fig. 63

(Fig. 64 I) In this manner the distance from the lay-cord loop to the underside of the sewing frame is measured so that the sewer may know where to fasten the key on the sewing cord. The forefinger of the right hand is then held under the key in order to secure the cord in place, and with the thumb on top of the key, the

key is brought out from under the sewing frame (Fig. 64 II), with the left hand the cord is wrapped across the top of the key on the side toward the sewing frame (Fig 64 III), and then the key is flopped toward the sewer so that it will pass between the two prongs of the key (Fig. 64 IV). Before the cord is cut off, it is tested for length by pushing it again under the bed of the sewing frame. If the length is correct, the cord is cut, with an end left about an inch long. The key must now be fastened under the bed of the frame. To do this, the cord is held taut with the left hand, and the key is kept in position with the first and second fingers of the right hand astride of the cord on top of the key, and with the thumb underneath the key (Fig. 64 V). The key is let down into the slot along the bed of the sewing frame and is held there with the left hand It will then be parallel with the slot, and in order to make it hold the cord in place, it is pushed down with the fingers or a folder, and is turned at right angles to the slot so that the prongs will be under the bed of the frame and the head and neck of the key will be under the outside bar of the slot (Fig. 64 VI). This is repeated for fastening all the cords to be used.

The cords are then adjusted so that they correspond with the marks on the back of the book. To do this, the book is first knocked up at head and back to get it squared It is then placed on the sewing frame with the head to the right and the back against the cords, and one cord after another is brought up so that all the cords line with the marks on the back of the book. The first cord should be set well up toward the right, with not more than four or five inches of space left between it and the right upright of the frame, so that the sewer, while working, may have space beyond the tail of the book to rest her arm comfortably on the bed of the frame.

All the cords should be strung up with the same tautness. They may be tightened by screwing up the two wooden nuts on the uprights so as to lift the crossbar. If any seems looser than the others,

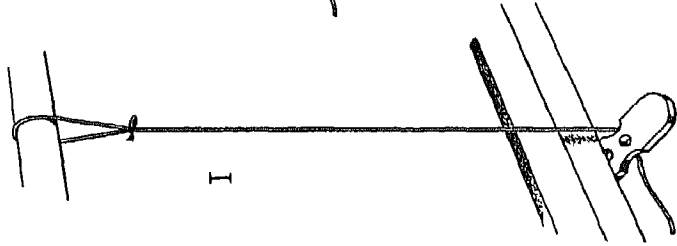
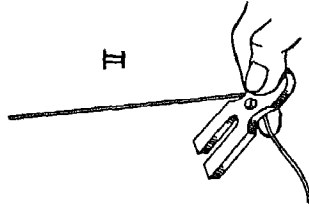
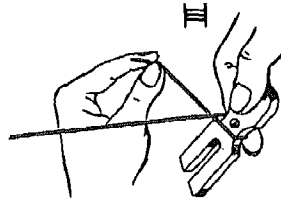
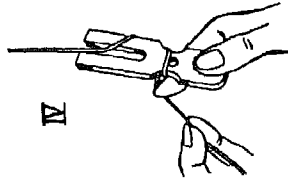
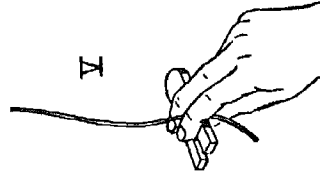
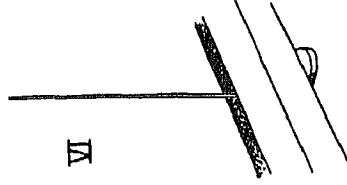



Fig. 64 I. Fig 64 II Fig. 64 III. Fig 64 IV Fig. 64 V. Fig. 64 VI

a piece of folded paper or cardboard is stuffed under the lay cord on top of the crossbar to tighten it, but if tested before being fastened, the cords should all be evenly taut.

If there is no blankbook sewing frame in the bindery equipment, tapes may be strung up in a manner similar to that used for cords. The tapes are fastened to the keys as for cords, but instead of being attached to the lay cords by means of a knot, they are pulled through the lay-cord loops and are held in place by pins (see Fig. 65). In order to be economical with tape, it is not cut, but is strung up in one continuous piece. This can be done by

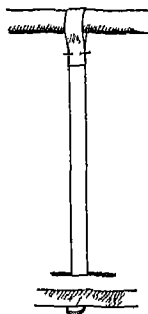



Fig. 65

leaving enough extra length between the keys and between the lay cords when they are strung up, so that it will be possible for the worker to move the tapes to conform with the positions for them marked on the back of the book

CORDS VERSUS TAPES

Flexible sewing around cords is the strongest type of sewing in use by hand binders, and hand-bound books should be flexibly sewed unless there is good reason for sewing them over tapes. In my opinion, there are only two valid reasons for sewing books over tapes instead of around cords The first is due to the format of the book, and the second is to allow the binder to have a

mooth back or an irregular grouping of bands in order to serve ome artistic effect in his scheme of decoration

The first reason, that of format, can be defended on the ground f utility. Books which are printed on thick, heavily sized paper nd are made up with thick sections will never open freely if they re flexibly sewn It seems a pity to bind these thick, stiff sections igidly together by wrapping the sewing thread around cords. So t is, the binder seeks a way out, and he frequently decides to sew he book over tapes in order to make for greater suppleness. But ven this manner of sewing will not entirely correct the stiff pening of a book if it has been printed on very heavy paper and s made up into thick sections The only way to escape the dire esult of a faulty format is to cut each section apart and make it p into several sections by guarding the pages together. This, of ourse, a binder hesitates to do and should never do without the onsent of the owner. If he fails to do it, however, he is often lamed unjustly for being unable to bind books that open freely, nd the real culprit, the printer, goes scot free

The second reason for sewing over tapes instead of around ords is less defensible than the first one, as it is dictated purely by consideration of aesthetics. However, I think it should be conceded as a proper practice under these circumstances so long as he binder takes care in sewing and uses strong materials for the work.

MATERIALS FOR SEWING

The size of the book should determine the size of the cord used n sewing, for the larger the book the thicker the cord must be, oth for strength and for appearance. Since the cords will represent the bands on the back of the book after it is covered, their ize has a bearing on the appearance of the finished binding. Sewng cord should be made of hemp with strands containing long ibers so that they may be frayed out and still retain their strength. When extra-heavy books seem to require especially

heavy cords, the book should be sewed on double cords. This method is stronger and produces a less clumsy appearance than would result if an excessively thick single cord were used.

All sewing tape should be unbleached, especially for use on heavy books, as bleaching chemicals serve to induce a rotting of the fiber of any material to which they are applied. The French, however, make a very finely woven tape that is bleached but exceedingly strong, and I have found it superior to some unbleached tapes, though the best quality unbleached tape is doubtless superior to it.

Thread for sewing should be made of unbleached linen. Linen thread is the most satisfactory for sewing, except when a very thin thread is called for, and then a surgeon's ligature silk may be used instead of thread. Any thread thinner than No. 30 is not suitable to use for sewing books, for it is liable to break when being tightened. Surgeon's silk will be found much stronger, and may be had in several thicknesses. I do not advocate using silk for sewing if it can be avoided, for it makes for a "slippery" book, that is, a book with sections that are liable to sag.

Hayes or Barbour's Irish linen thread will be found to be of excellent quality. It is sold by the pound and is numbered according to its thickness. Numbers 12, 16, 18, 20, 25, and 30 should be in stock to choose from, No. 12 being the thickest.

KINDS OF SEWING

There are three different types of sewing used by the hand binder. Flexible sewing around single or double cords is undoubtedly the strongest type and is that which is in general use in hand binderies. Its disadvantage, as I have already explained, lies in the fact that it tends to make for a stiff opening of a book when the text is printed on heavy paper, as the thread is wound completely around each cord so that the sections are held rigidly in place. Sewing over tapes induces an easier opening, and if

done with great care is quite strong and serviceable. Sewing "two-on" is by no means as strong as the other two types, but it is sometimes necessary to resort to it in order to reduce the swelling on the back of a book Under no circumstances should sewing over sawn-in bands be practiced, as the book is weakened by being sawed into, and the holes produced are unsightly This questionable method of sewing is used by some job binders, as it makes for speed. In Figs 69 the thread pattern is shown for each type of sewing recommended above.

After the sewing frame has been strung up and the cords or tapes have been adjusted to the markings for the bands on the

Fig. 66.

back of the book, the sewer should first determine the size of thread to be used

The sewing thread runs all along the inside fold of each section, and it produces an added thickness, or swelling, at the back of the book. Some extra thickness is necessary if the book, after being backed, is to have a "joint" large enough to equal the thickness of the cover boards, for it is this increase in thickness along the folds of the book that permits the binder to turn over this joint into which the cover boards hinge (see Fig. 66). Too much or too little joint will cause a ridge on the leather cover along the back of the book Hence a nice calculation must be made in selecting the proper thickness of thread.

Only experience will develop judgment in making this decision, but there are certain characteristics of the book format that play a part in it, and some general rules may be laid down to aid

the sewer in arriving at the right thickness of thread to use. Three things must be taken into consideration the number of sections making up the text, the thickness of the sections, and the quality of the paper. If the sections are few and thick, a thickish thread is required. If they are numerous and thin, then a thinner thread is called for. If the paper is soft-finished and not heavily sized, the thread will sink into it and its swelling value will be diminished. Conversely, the thread will stand out on a sized paper and notably increase the swelling of the sections. Summing up roughly, we may say that fewness of sections and unsized or slightly sized

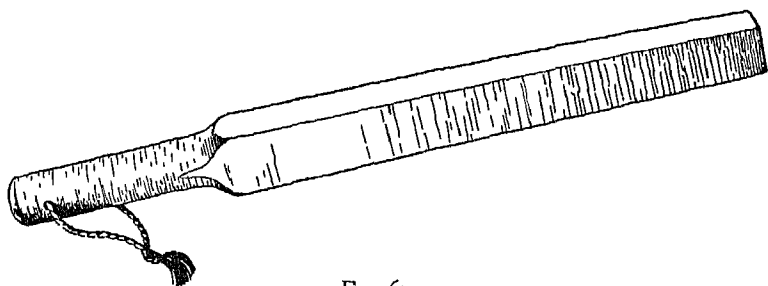



Fig 67

paper tend to call for a heavier thread than numerousness of sections and heavily sized paper

Having made the choice of thread to be used, the binder fastens the skein around the right-hand upright of the sewing frame, convenient for use, and selects a darning needle with an eye that will receive the thread easily. A darning needle is used for sewing thread because it has an egg-shaped eye that allows the thread to go through without too much bulking For silk, a milliner's needle with a round eye is used, and after the needle has been threaded, the silk is spliced with the point of the needle about an inch from one end. This splicing will fasten the needle and keep it from slipping off while working

A pair of shears, a folder, a sewing stick (see Fig. 67), and a

low stool are needed for the sewing operation. It is necessary to use a low stool so that the sewer may rest her left arm comfortably on the bed of the frame and will be in a position to sew efficiently and to use both hands in the operation.

The book having been collated and made ready for sewing, it is placed on the workbench back of the bed of the sewing frame with the head to the right and the fore-edge toward the worker. Then a pressing board is laid on the bed of the frame up to the cords so as to elevate the book while sewing, because it is difficult

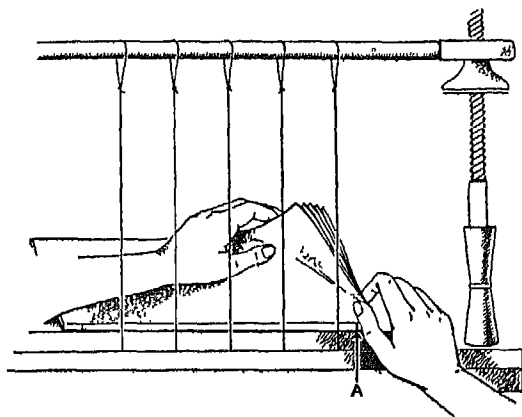



Fig. 68.

to insert the needle through the sections unless they are raised above the bed of the frame

When beginning the sewing operation, the worker takes the top section off the book with the left hand and turns it over so that the fold faces her and is brought forward onto the bed of the frame. The section is grasped with the right hand at the fold as shown in Fig. 68, and with the left hand half the pages are counted off until the middle of the section is reached. The left forefinger is held in the middle of the section, and the section is knocked up at the head It is placed against the sewing cords, with the head to the right and with the marks on the back of it

adjusted to the position of the cords. Holding it in this position, with the left hand inside the middle of the section, the sewer is ready to begin sewing the section around the cords (see Fig. 70).

FLEXIBLE SEWING ON SINGLE CORDS From the thread pattern for flexible sewing on single cords shown in Fig. 69 A, it will be seen that the sewing thread is wrapped entirely around each cord as the section is being sewed Assuming the position indicated in Fig. 70, the sewer begins sewing the first section at the head of the book, up toward the right upright of the frame. The threaded needle is run through the kettle stitch A (Fig. 68) from the outside of the section, with the right hand, and is received on the inside of the section with the left hand. Then, without pull-

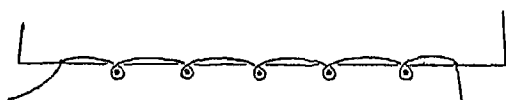



Fig 69 A

ing the thread all the way through, the needle is pushed out from the middle of the section on the left side of the first cord and is received with the right hand. The thread is pulled toward the sewer until there is left only about two inches of it protruding from the kettle stitch. The needle is now inserted on the right side of the first cord, is received by the left hand inside the section, and is pushed out on the left side of the second cord. It is pulled tightly and inserted on the right side of the second cord. This manner of sewing is continued around all five bands, when finally the needle is passed out of the kettle stitch at the tail of the section. The next section is then put in place on top of the first one, after the center is found as previously directed, and it is lined up squarely at the head with the first section. A folder will be found convenient for this purpose. Next, the needle is inserted through the tail kettle stitch from the outside of the section and is

pushed out on the right side of the fifth cord The thread is now pulled tightly and the needle is inserted from the outside on the

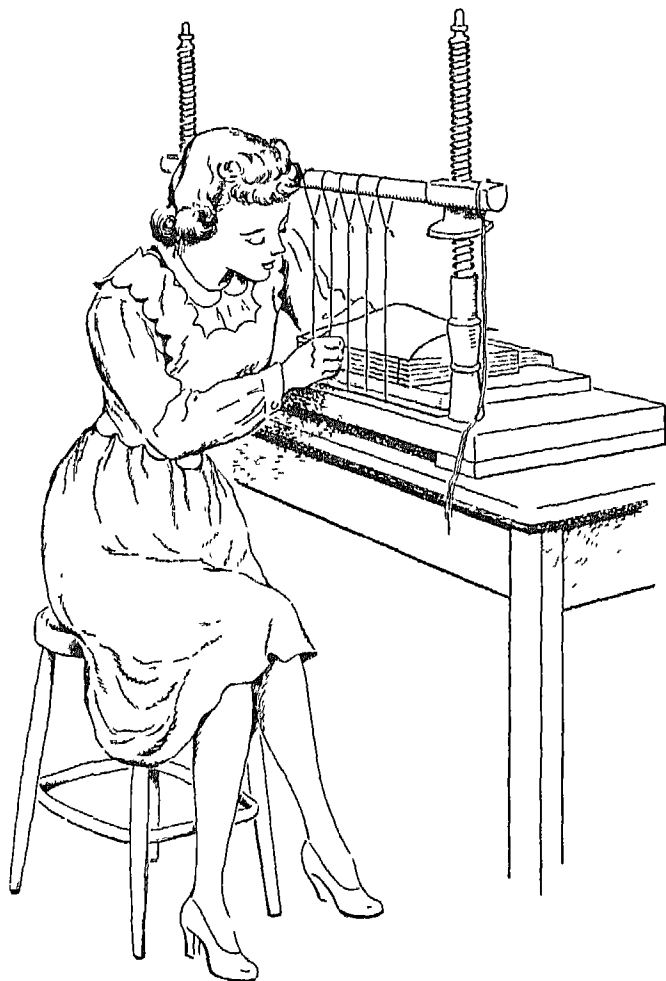



Fig 70

left of the fifth cord, thus completing the wrapping of the cord. It is brought out again on the right side of the fourth cord, and the sewing is continued in this manner until the head kettle stitch

of the second section is reached. When the thread is brought through this kettle stitch to the outside of the section, it is tied to the loose end of the thread projecting from the kettle stitch of the first section. To make this knot, the thread fastened to the needle is wrapped around the left hand to form a noose. Then the hanging end is stuck up through the bottom of the noose, and the thread is pulled up tightly. This knot is repeated so as to ensure a tight fastening, and the loose end of the thread is cut to a length of about one-half inch and is placed between the second and third sections on the inside of the text It may be frayed out and made soft so that it will not mark the book. It should not be left on the outside of the sections, as it would form a ridge on the back of the book after the book is covered.

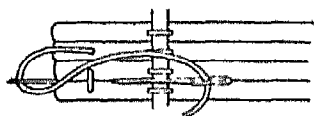
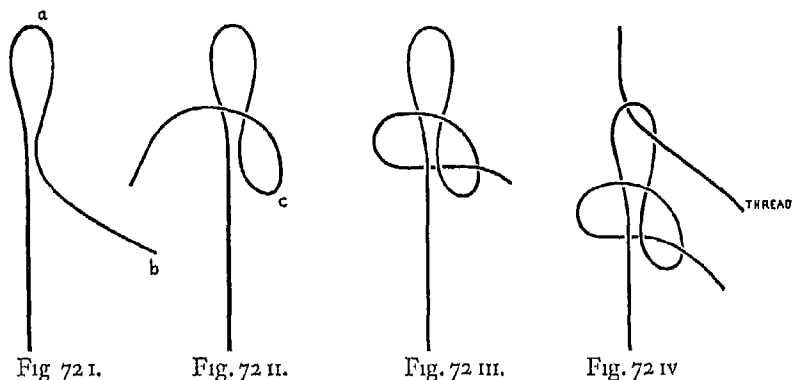



Fig. 71

After the third section is sewed and the thread is brought out of the kettle stitch on the back of the section at the tail, there must be a fastening made between the second and third sections. As there is no loose end of thread to fasten to, the fastening is made by inserting the needle under the second section, as in Fig. 71, and then putting it through the loop made by the thread coming out of the third section at the kettle stitch. The thread is pulled up tightly and the sewing is continued. This manner of sewing by pulling the thread out of the far side of the section and returning it on the opposite side is continued through the whole book. All sections, after the first two, are fastened together by sticking the needle under the section to be fastened and drawing it through the loop formed. Care must be taken to pull the thread tightly at each band after it comes from the inside of the section, and it must be pulled straight along the sewing frame and in the

direction in which the sewing is proceeding, for otherwise there is danger of splitting the paper. When the final section, or end paper, is sewed, it is fastened off like all the others, except that two fastenings are made instead of one. In other words, after fastening the last section to the first one below it, the worker repeats the fastening under the second one below, draws the thread through into the inside of the back between the sections and cuts it off, leaving about one-half inch. The thread is then frayed out and left between the sections.

Fig 72 I. Fig. 72 II. Fig. 72 III. Fig. 72 IV

When one strand of sewing thread is used up, another strand must be tied on with a weaver's knot To make this knot, first an ordinary slipknot is made on the end of the new thread. This is done by holding the thread with the left hand and forming the Loop a as shown in Fig 72 I. Then the free end of Thread b is passed over in front of Loop a, thus forming a second Loop c at right angles to Loop a and passing over it (see Fig. 72 II) Next the free end of Thread b is brought around the back of Loop a while Loop c is kept flat in place by holding the left thumb on it, and the end is stuck up through Loop c from the underside (Fig. 72 III). The end is pulled down, and the knot pictured in Fig. 72 IV results. This knot is pulled up from both End b and the other long end of the thread, with the left thumb kept on top of the

knot as the pulling is done. The thread coming out of the book is then inserted into Loop a from the underside, and with the right hand it is grasped together with End b. The two threads are simultaneously pulled against the long end of the thread. If directions are followed carefully, this knot will hold. The only trick in making it is being sure that Loop c is kept in position as shown in Fig. 72 IV. If the top of this loop is allowed to fall over, the knot will not hold. After the knot is made, it must be pulled into the inside of the section and left there.

During the operation of sewing, it is essential to keep an even tension of the thread all through the book. The sewing must not be too loose, so that the sections sag, nor too tight, so that the thread is strained. Especial care must be taken to keep the two kettle stitches evenly tightened, else the head of the book will be broader than the tail, or vice versa. In order to ensure an even line all along the sections, it is well to use the sewing stick (Fig. 67) during the process of sewing. By inserting this stick (which is loaded at the end with lead) between the cords, and using it to tap the sections on the top, the book may be made solid and kept even in thickness. To remove the book from the sewing frame after the sewing is finished, first the cords are freed from the lay cords by pulling their ends. This unties the knot. Then the keys are freed

If this ambidextrous method of sewing is adhered to, the tension of the thread is sure to be more even than in any other manner of sewing, because the left hand is held against the inside of the fold and serves to keep the sections close up against the cords. At first it may be somewhat awkward for a beginner to make the left hand do its allotted work, but after a little practice, this method becomes a mechanical matter, and both speed and ease in sewing are facilitated, for the sewer has no need to interrupt the rhythm of the operation by having to stop and inspect the sewing on the inside of the fold

Flexible Sewing on Double Cords. Books were usually sewed on double cords in mediæval times, and this type of sewing is very desirable for large, heavy books, as the double wrapping of the thread around the cords makes for great strength. This wrapping forms a figure eight (see Fig. 69 B) so that the thread if broken on one cord will be held by the other; thus a section is prevented from being entirely loosened Flexible sewing over double cords follows the same procedure in general as that for single cords, the only difference being that the wrapping operation is repeated each time Starting at the kettle stitch near the head of the book, the needle is inserted and then, after being received by the left hand on the inside of the section, it is pushed out between the two cords, is wrapped around the first of the two,

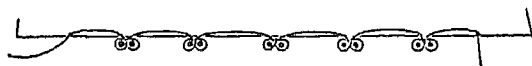



Fig 69 B.

and is inserted on the right side of it. The needle is next brought out on the left side of the second cord and is pushed in again between the two cords.

Sewing on Tapes. When stringing up with tapes, the operator must be sure to keep the tapes flat. A book sewed over tapes is not as firmly held together as one flexibly sewed, and in order to avoid too great looseness, it is best to catch every four or five sections together with a stitch called a "catch stitch." The thread for sewing on tapes does not encircle the tapes but merely passes over them. It comes out on one side of the tape, goes over it, and then returns to the inside of the section, and so on After three or four sections are sewed, the catch stitch is made. To make this stitch, the needle, after it comes out of the right side of the tape and before it goes across the tape, is pushed eye-end down under the three or four threads below it and is then inserted into the

loop formed by this procedure. The thread is pulled up tight, forming a knot in the center of the tape, and it is afterward drawn back into the middle of the section. The catch stitch is made on all the tapes to the end of the section, as shown in Fig. 69 C To unfasten the book from the frame, the tapes are all unpinned. Then the first tape is pulled through the sewing at the back of the book, an end of about one and one-half inches being left, and the opposite side of the tape is cut to the same length. Each tape is pulled through in this manner and is cut off. Thus all the tape not needed for the job is left in one continuous piece and may be used again.

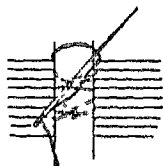



Fig. 69 c.

SEWING TWO-ON. Sewing two sections on at a time is obviously not as strong as sewing "all-along" and is done only when it is necessary to reduce the swelling in the back of the book that would be caused by sewing a large number of very thin sections together.

When sewing a book "two-on," the first and last two sections should be sewed all-along. After the first two sections are sewed, the next section is put in place and is lined up at the head with the one under it. The thread is then inserted at the kettle stitch of this section and is brought out at the left of the first cord. Then a folder is put in the middle of this section to keep the place easily, and the following section is put in place. Now the needle is inserted into the upper section on the right side of the first cord and is brought out on the left side of the next cord. Then a folder is put inside this uppermost section to keep the place, and the thread is inserted on the right side of the section below, and so on

along the length of the book. Finally, the last two sections are sewed all-along. This will form a thread pattern such as is shown in Fig. 69 D. With this sewing, there will be only three stitches of thread inside of each section, in a book sewed on five bands,

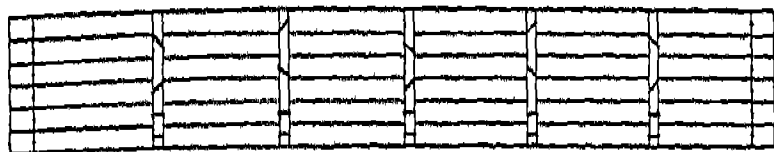



Fig. 69 D.

whereas there would be six stitches if the book were sewed all-along. Hence the swelling in the back of the book will be reduced by half. The work is strung up and removed from the frame as for flexible sewing on single cords.

CHAPTER X

FORWARDING (Continued)

Fraying out Slips, Gluing Up and Rounding, Backing

FRAYING OUT SLIPS

AFTER the book has been sewed, the ends of the cords should be cut off, about two inches on each side of the book being left. These ends are called "slips," and they must be frayed out soft enough so that they can be laced flat through the boards.

To fray out the slips, the book is placed on the workbench with the back toward the worker, and a carpenter's awl or a binder's bodkin is inserted into the cord in order to separate the strands (see Fig 73). Most English cord is made of two strands, but

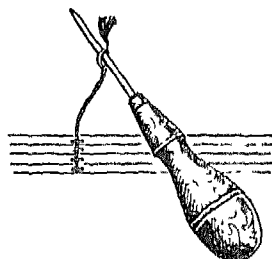



Fig. 73.

cord of other manufacture often has three or four strands. After the strands are separated their fibers are then made into a soft mass by fraying them out with an awl which has the point flattened on two sides (see Fig. 74). This flattened point makes it possible to fray the slips without curling them if it is inserted into them from the back, with the thumb held against them at the front, as shown in Fig. 75. It does not do to simply pass the awl over the surface of the slip. The point must be made to actually pierce the strands in order to separate the fibers.

It is well to hold the opposite end of the slip while it is being

frayed out, or the whole cord may be pulled through the thread loops. If this should happen, it probably means that the sewing is too loose, but the damage may be remedied by threading the slip through a large-eyed darning needle and working it again through the thread loops. However, rarely is it possible to work

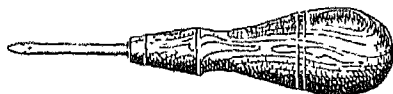



Fig 74.

the slip back in its entirety, and it is wise to avoid such an accident by keeping firm hold of the lower end of the slip.

GLUING BOOK AND ROUNDING

GLUING UP. The next operation after fraying the slips is gluing up the back of the book and rounding it, preparatory to backing. The gluing-up process is necessary in order to hold the sections together while they are being formed into the shape they are to assume permanently.

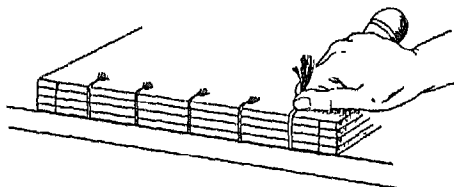



Fig 75

There are many kinds of glue, each of which varies in quality. Only the best quality glue should be used in bookbinding (see Chapter XXI, p. 314). After the glue is heated, it should be thinned down with water for the gluing-up operation to a consistency which is neither too thick nor too thin. If too thick, it will make too heavy a coating on the back of the book which tends to stiffen it and hinders its easy opening. If too thin, it will penetrate

too far between the sections and will damage the pages of the book. There is a tendency to use the glue too thick rather than too thin.

Glue should never be used in front of an open window unless the outside temperature is quite warm, for the least draft tends to congeal it. Glue should be hot enough to run freely from the brush when tested in the gluepot and if further testing is needed, it may be spread on a piece of wastepaper to be sure that it does not drag when being applied A certain amount of speed is necessary in spreading glue, for it dries quickly, and for this reason, before beginning to apply glue, it is necessary to have everything in readiness for a straightforward job All tools and materials used in the work must be conveniently placed. Delays caused by the necessity of shifting the position of the work, with the glue brush poised in mid-air, are likely to be fatal.

To glue up the back of a book, it is knocked up at head and back until all the sections line up evenly and are square at the head. It is very important to have a book knocked up evenly and squared perfectly before gluing, for it is almost impossible to change the position of the sections after they are once glued. A single thickness of wastepaper is laid on the workbench so that it projects beyond the edge of the bench and can be folded down over the edge. On the paper, the knocked-up book is placed even with the workbench edge. The head of the book is kept to the right, and the lower slips are tucked in and made to lie flat underneath the book so that they will not be glued. Then the upper slips are spread flat over the top surface of the book, and an old cover board is laid on top of them and is brought up even with the back edge of the book. The cover board is held very firmly in this position, with the left hand pressing down with considerable force to prevent the glue from oozing through onto the outside surface of the end papers. A rather sparse coating of glue is then applied to the back of the sections. (A thin coating of good glue

will perform its function far better than a thick coating of inferior glue.) The glue should be well brushed on so that it will slightly penetrate between the sections, and it should be applied with a stroke toward the head and tail edges of the book, in order that these edges will not be stained by it. A large, rather short-bristled, copper-set brush is used for gluing, and it should be held as for spreading paste, in order to give the worker proper control of it (see p. 43).

Many English hand binders screw the book up in the press for the gluing-up process, but this method takes more time than the one just explained, the slips are more likely to get daubed with

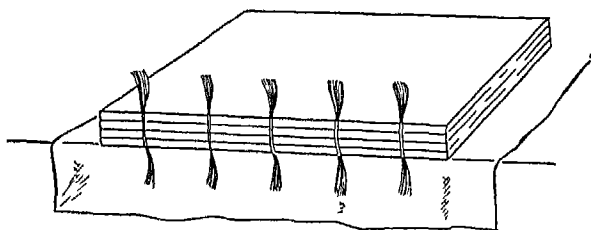



Fig 76

glue, and, if the book is screwed up too tightly, no glue will penetrate between the sections. It is desirable that an infinitesimal amount of it should penetrate, first in order to make the book less likely to separate inside between the sections, and also to hold the book sufficiently rigid so that it will remain solid after most of the glue is cleaned off.

After the gluing is finished, the book is taken between the two hands and is knocked up at back and head firmly on a piece of wastepaper. It is then set aside on the edge of a table or bench to dry, with the slips brought out at right angles to the side of the book (see Fig. 76). If there is any glue on the frayed slips near the book, it should now be cleaned off with a knife before it has time to harden.

An ordinary gluepot like that used by cabinetmakers answers the binder's purpose. The glue is heated in it over a gas stove. But a more convenient gluepot is an automatic electric one with a pilot light. A gluepot should be fitted with some device so that all surplus glue can be taken out of the brush before it is used. Some binders fasten a heavy wire or a braided cord from one ring of the pot handle to the other ring so that the wire or cord stretches tightly across the middle of the pot. The surplus glue may then be taken out of the brush by stroking it over this rigid line. Other binders keep a small wooden paddle in the gluepot

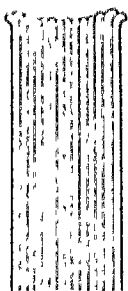



Fig. 77 A Fig. 77 B

and stroke the brush against it in order to remove the glue. (Consult p. 315 for information about preparing glue.)

ROUNDING. The back of every book must be made convex in shape, or the very weight of the sections will force it into a concave form (see Fig. 77 A). We have examples of sunken backs in some of the mediæval books now extant.

The object of rounding the backs of books is to produce a smooth evenly curved surface that can be successfully titled; to prevent sinking in; and to utilize the swelling value of the sewing thread so that a "joint" may be formed to support the thickness of the cover boards and keep them from slipping over the

back of the book. If there is too great an amount of swelling, due to miscalculation about the thickness of thread used in sewing, the back will have an exaggerated roundness that is not attractive and that hinders the free opening of the book (see Fig. 77 B). If not enough swelling has been achieved in sewing, it will be difficult to induce a sufficient amount of joint to hold the boards, and the back will be dangerously flat. The flatter the back of a book the easier the opening — all things being equal — and a good rule to follow is to produce only enough swelling to ensure a sufficiently large joint and to leave the back as flat as possible consistent with utility.

After the back has been glued and has been left until the glue ceases to be "tacky," the book is ready to be rounded. It should not be left so long that the glue becomes hardened. Preliminary to the actual rounding, the book is placed on the workbench with the fore-edge toward the worker, and the sections are "started" from the center outward. To do this, the back is brought over toward the worker by placing the fingers of the right hand under the book and the palm of the hand on top of it and forcing the sections over until the back lies almost flat and is inclined toward the worker (see Fig 77 C). Then the backing hammer is grasped in the right hand, and the sections are stroked from the center upward with a light tapping all along the back and with the hammer held so that the handle is at right angles to the length of the book (see Fig. 77 D). The book is then turned over and the same operation is repeated on the opposite side. This starting of the sections in the proper direction makes for an easier and more symmetrical rounding.

Next the book is knocked up at the head and back and is placed upon the bench again with the fore-edge toward the worker. With the thumb of the left hand in the middle of the fore-edge and the fingers spread out over the upper part of the book, it is held firmly while, with the fingers of the right hand under the

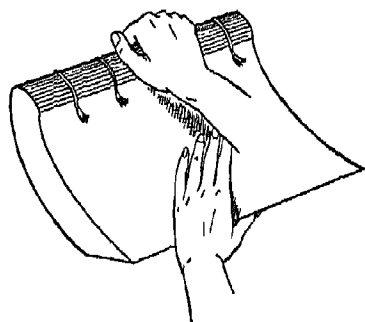



Fig. 77 c.

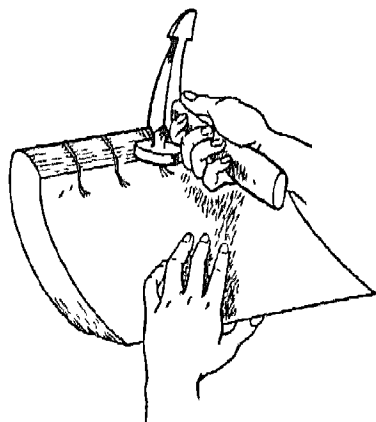



Fig. 77 d.

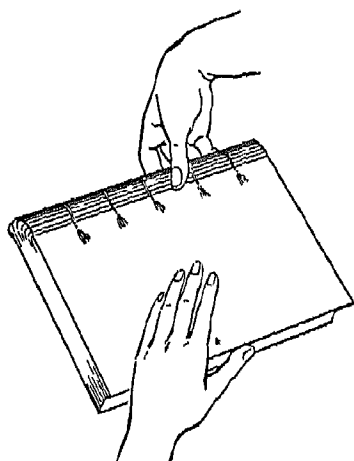



Fig 77 e

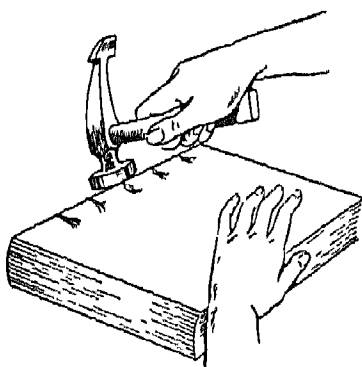



Fig. 77 f

book at the back, the palm of the hand draws the back over evenly all along the length of the book (see Fig 77 E). Held in this position, the back of the book is lightly stroked with the hammer from the center upward all along, and then on top of the book all along the back edge, the book is hammered smartly with a few evenly directed perpendicular strokes. This clinches the sections in the position they have assumed (see Fig. 77 F). Now, with the book held very firmly to keep the upper half in this position, it is turned over, and the same operation is performed on the second half of the book

If adroitly done, the rounding will be perfect. If it is not perfect, the book should be tapped and brought into a symmetrical shape. This completes the rounding.

If the glue has been left too long and is hardened, it may be softened by moistening the back with a dampened sponge several times and then left to stand until it becomes pliable If necessary, it may be freshened by applying an excessively thin coating of glue

BACKING

The object of backing a book is to solidify and make permanent the round shape already given the back and to make the groove, called a "joint," on each side of the back for the boards to lie in. This is accomplished by fanning one section over the other on each side of the center of the back, thus making the sections with their thread stuffings incline toward the edges and away from the center, and then by turning over at right angles the first and last sections, to produce the "joint" If the sections were not thus fanned over, it would be impossible to form a joint that would hold, for the bulk of the sections with their added thread must be induced to incline their weight toward the side edges of the back in order to make a reinforcement to hold the joint firmly.

In a book composed of ten sections, there are ten strands of thread, running all along the inside folds, which make the back that much thicker than the fore-edge of the book. This extra thickness, or swelling, must be properly disposed of, for unless it is utilized to make the back evenly round in shape and to form a joint, after the boards are laced onto the book and the book is pressed, it will cause the back to cave in and will produce a wavy fore-edge line. If there is too much swelling in the book, so that the back becomes exaggeratedly round, the sections are almost

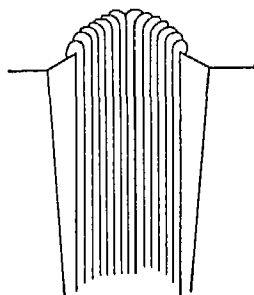



Fig. 79 C.

sure to split in the center when the book is being backed (see Fig. 79 C).

The sections must be fanned over evenly with a sidelike stroke of the hammer that follows a curved line like that bounding the sides of an ellipse (see Fig. 78), rather than with a direct, straight stroke. A direct blow of the hammer will crush the sections, as shown in Fig. 79 A, and a creased line will result on the inside of the book along the back An uneven fanning over of the sections will produce a deformed back (see Fig. 79 B), which, though it may be corrected to some extent and be forced into a fairly symmetrical shape, will almost certainly tend to return to its crippled contour after a little use of the book.

To back a book after it has been glued up, it is placed between backing boards and is lowered into the lying press. First, with a

pair of spring dividers, the thickness of the cover boards to be used is measured, and this distance is marked on each outside section near the head and the tail. To indicate the measure on the

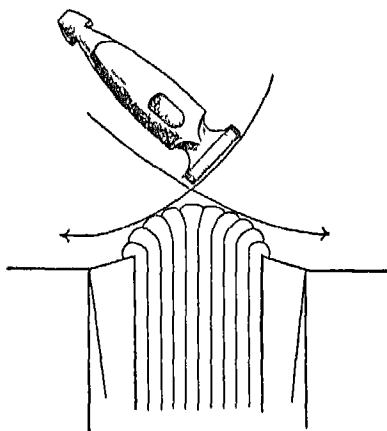



Fig. 78.

book, one prong of the dividers is placed at the back edge of the sections, and dots are made with the other prong on the sides of the sections. The dots are marked with a pencil point. This dis-

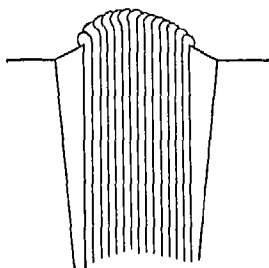
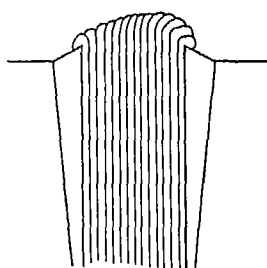



Fig. 79 A Fig. 79 B

tance represents the width of the joint to be turned over. The press is then opened evenly to a distance approximating the thickness of the book, plus the thickness of the backing boards. Each side of the book and each backing board is lightly chalked

with a piece of white chalk to keep the book from slipping. One backing board, an inch or two longer than the book, is now placed across one end of the press, with the beveled edge away from the worker and the steel face uppermost. The book is laid upon this board, and the flat face of the second board is placed on the upper side of the book exactly up to the dots made to indicate the width of the joint, with the slips left sticking out.

Since the book is lying in a position straddling the press opening, it may then be picked up easily with the boards, and it is turned over without disturbing the position of the backing board that has been correctly placed. The book should now be placed as before, straddling the opening of the press, with the back away from the worker. The first backing board, on which the book was laid without exact placing, is put in position on the dots, with the slips of the book out, and it is pressed down firmly until the edges of the two backing boards are in line with each other. With the left hand, the book and boards are picked up and placed between the opening of the press while the right hand screws up the press sufficiently to hold the book lightly. Then the operator steps to the side of the press, adjusts the book so that it is exactly the same distance from the screws of the press at each end, and gradually lowers the book into the press jaws by pushing it down and unscrewing the press a very little at a time until the lower edges of the bevel of the backing boards rest even with the jaws of the press (see Fig 80).

It is now necessary to tighten the book in the press evenly to prevent it from slipping while it is being backed. If the book has not been placed so that each end of it is equidistant from each screw, it cannot be tightened evenly. Hence, the distance between the screws is measured at each end and is kept even while the book is being screwed up. To screw up the press, an iron pin is placed in the holes of the screw operating ends (see Fig. 1), and the screws are thus revolved and tightened.

Standing either at one end or on one side of the press while backing, the worker holds the hammer close up to its iron head, with the handle parallel to the length of the book. Beginning at the center of the back, all the sections are fanned over on each side from the middle toward the edge, using the stroke pictured in Fig 78. The first strokes should be light all the way across the back in order to effect an even, smooth contour. Then the back should be gone over again with increasingly heavy strokes until all the fullness has been brought over to the line where the joint is to be formed. When this is accomplished, the hammer is tapped

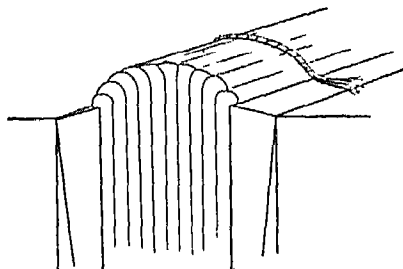



Fig. 80

along each joint until the joint has been turned over sharply at right angles to the back. This stroke is more direct than the stroke for fanning over the sections, but it must not be too heavy, for fear of splitting the end papers.

When a book has too much swelling, it is often difficult to get it into the press for backing and keep the backing boards from slipping below the marks indicating the joint. This difficulty can be overcome by inserting into the sheets of the text a few pieces of newsboard fully as large as the pages of the book These boards should not extend up to the back of the sections but should be placed about three-eighths of an inch forward of the back folds. The book may then be lowered successfully into the press without slipping below the joint marks. The sections are first fanned

over up to the line of the joint, but the joint must not yet be turned. The book is taken out of the press after this first fanning over, and the cardboards are removed. It is then put back into the press and will be found to hold in place without the cardboard

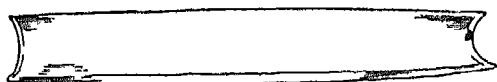



Fig 81.

stuffing after it has been given this rounded shape. The backing is then proceeded with, and the hinge is turned over

When the backing is finished, it is good practice to remove some of the glue and rub over the back with a piece of wood with a curved end, called by the French a "frottoir" (Fig. 81). To remove the glue, some thin paste is put over the back and is left to stand a few moments. The glue will then be found to be softened

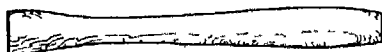



Fig 82

and will yield to the action of the frottoir, which may be used to smooth out any irregularities in the shape of the back. Before removing the book from the press, it is well to check the cords for distance and straightness. If they need to be moved, they may be dampened slightly with a sponge, then a straight, thinnish piece of boxwood, like a modeler's flat stick (Fig 82) is put against each cord, and the end of the stick is tapped with a hammer until the cord is straightened and brought to the position desired. After the book has been taken from the press, it should be kept between boards large enough to protect the joint, and when laid down without boards while in work, the joint should protrude beyond the bench so that it will not be injured.

A backing hammer, in my opinion, should be fairly heavy and should have a large, almost flat face and a short handle (Fig 83 A). It should be so weighted that when held close up near the iron head, as it should be held in backing, it almost balances in

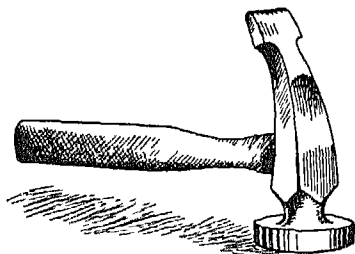



Fig. 83 A

the hand without grasping it around the handle. Some binders prefer a small, light backing hammer with a square head (Fig. 83 B), and they contend that it is easier to turn the sections over evenly near the bands with such a hammer than with a large,

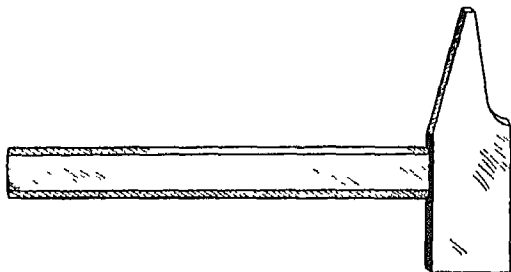



Fig 83 B

round-faced one. However, I believe better backing can be done with a large, heavy hammer than with a light, small one, for the very weight of this hammer makes it unnecessary to force it, and as the hammer covers a larger space, it is less likely to leave little indentations on the back of the book As for being able to reach the sections close up to the bands with a large hammer, that is

purely a matter of knowing how and of having a hammer with the face not too rounded, for if the hammer is tipped so that only the forward edge is allowed to come in contact with the sections

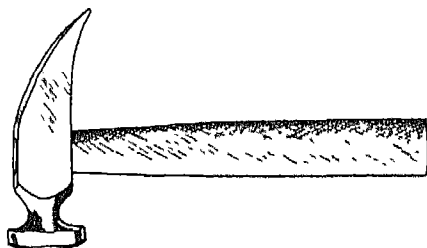



Fig. 83 C

next to the bands while the stroke is being made, the sections may be turned over at this point, very neatly and evenly. A smaller model of hammer is sketched in Fig 83 C.

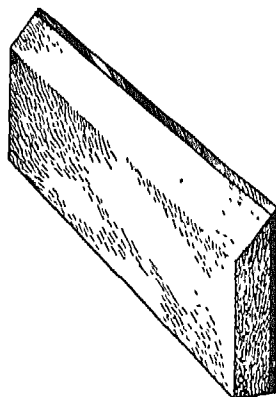



Fig 84 A

Backing boards are usually made of wood, beveled on the upper edge and faced with steel. Several pairs of these boards, suitable for different-sized books, will be needed. The bevel should be fairly long, to avoid the possibility of cutting the book along the joint (see Fig. 84 A) All-steel backing boards are preferred by some binders. They are long so that they may be used

for a book of any size, and they are put in the press separately from the book with their projecting flanges resting on the cheek of the press (see Fig 84 B) Then the book is placed between them on the line of the joint. When a book is perfectly rounded

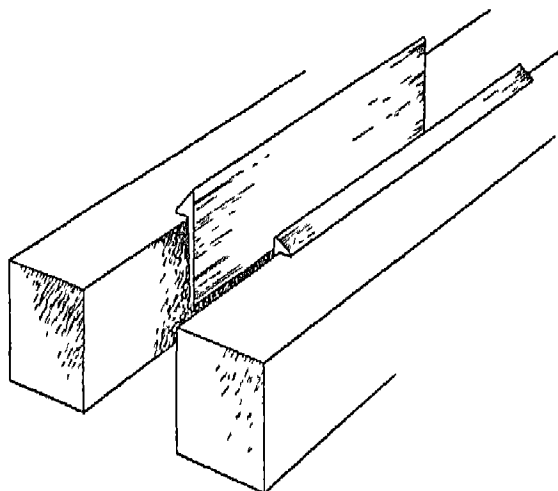



Fig 84 B.

and has not too much swelling, it may be more quickly placed in the press for backing between the all-steel stationary boards than between adjustable boards, but because of the fact that the steel-faced boards are adjustable, they permit of manipulation in the placement of a book that is often very desirable and sometimes even necessary.

CHAPTER XI

FORWARDING

Cutting Boards to Book. Holing-out and Grooving Boards for Lacing. Lacing-in

CUTTING BOARDS TO BOOK

A DIFFERENT calculation must be made for cutting boards to size for a book which has the head already cut and the other edges trimmed or left rough, than for a book the edges of which are to be cut "in-boards." I shall explain how to estimate the size of boards in both cases.

CUTTING BOARDS IN A LEVER CUTTER. Cutting and trimming book-edges are two distinctly different operations, and most hand binders cut only the head of a book and leave the other edges untouched or merely trimmed. To cut boards for both these types of books, the lever cutting machine is generally used, although boards can be cut with the plough when there is no cutting machine in the equipment Boards may even be cut by hand on the bench, but this is not practical for a binder whose time is a consideration The hand method of cutting would never be used except by the amateur binder who had to work without much equipment. The rules to follow in measuring for the size of the boards are the same in any instance.

When cutting boards in a lever cutter, first a straight edge is cut along the length of the board. This is called "backing" the board. The board is then squared at one end, is next cut for length, and is finally cut for width

One board is placed with the long edge under the knife anywhere in the middle of the cutter, and the least possible amount is cut off it in order to produce a straight edge. The second board is likewise cut. One board is then held at the near end of the cutter against the metal edge used for squaring, and one end of it

is squared to the straight edge just cut. This is repeated on the second board. Then one of the boards is placed on the side of the book, and calculation is made for cutting the length. The board should extend in length over the over-all length of the book about one-eighth of an inch at both head and tail This extension of the board beyond the text is called the "book-square." When this length has been determined, it is marked on the board at the cut edge. The board is now put in the cutter up against the squaring line, and when it is placed so that the knife will cut through the mark, the guide on the top of the cutter is set so that it touches the back edge of the board. The length is then squared on this board, and the second board is placed in position and squared to the same length. The width of the board is cut in like manner.

To measure the length of the boards for a book the fore-edge and tail of which are to remain uncut, a board is placed on the book so that its squared end extends about one-eighth of an inch beyond the cut head of the book. It is then marked at the other end so as to allow it to extend one-eighth of an inch over the tail of the book.

To measure the length of the boards for a book to be cut in-boards, the amount to be cut off the head and tail of the book should be determined and marked on the front end paper of the book. Then one-eighth of an inch is allowed for the book-squares at head and tail, by adding one-quarter of an inch to the final length indicated for the book.

The manner of measuring for the width of the boards will also differ for the book with trimmed edges and the one cut in-boards In both cases, however, the two end-paper sections are first cut to the longest width of the text, as they are usually pushed forward in backing. To measure for cutting the end papers, the point of one prong of a pair of wing dividers (see Fig. 43) is placed close up into the joint on the outside protection

sheets, and the end papers are slightly raised at the fore-edge so that the width of the first and last sections of the text may be seen. The points of the second pair of dividers are opened and set to an average measure. This distance is marked on the fore-edges of the two end papers, and they are cut to it with a knife and straightedge, after a cutting tin has been put under the end-paper sections. For a trimmed-edge book, an eighth of an inch is added to this measure for the width of the boards, in order to have the same book-square on all three sides. For the book to be cut in-boards the amount to be cut off the book is determined and marked on the book. Then the dividers are set to one eighth of an inch beyond this mark, measuring from the joint. It is wise to allow a generous measure for the boards of books cut in-boards, because if the squares are too large after the boards have been laced on, it is a simple matter to cut them down, and if the squares prove to be too small, a new pair of boards will have to be gotten out. However, small squares look trimmer than large ones on a book, and at the fore edge they enable the reader to open the book with greater ease. An experienced workman can calculate to a nicety for these measures.

By using the back guide in cutting and the metal side for squaring, the two boards will be cut of an exact size, and both of them will be square. Boards must be square, or the squares of the book will not be even. A good cutting machine, if kept with the knife frequently sharpened, will cut boards to a very smooth edge.

CUTTING WITH A PLOUGH. To cut the boards of a book with a plough, the lying press is turned over so that the cutting side is uppermost. The two boards are then lowered into the press with two thick cover boards or a wooden cutting board back of them, that is, on the side next to the runners, and the press is screwed up tightly. A straight edge should be cut off the long side and as

little as possible taken off the board A cutting board (Fig. 91) is like a gilding board except that it is not quite so wide, and it is used to "back" the boards that are being cut, in order to prevent the knife from cutting into the cheek of the press.

To do this cutting, the operator stands at the end of the press, with the plough knife on his right, and he pushes the plough forward and screws it up until it touches the board. Then holding the plough with his right hand on the handle and his left hand on the end of the screw, he runs it forward and backward and makes the knife cut into the board by slightly screwing it up

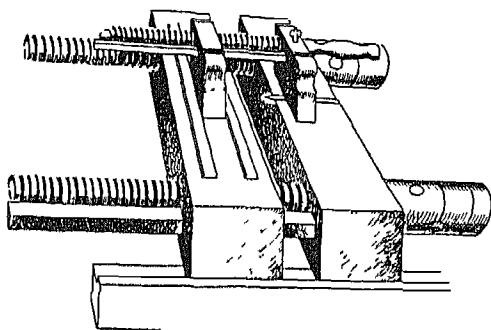



Fig 85 A.

with the handle as it goes forward and releasing it a little as it comes back. The plough must be kept firm on the cheeks of the press as it runs through the guides and is made to cut (see Figs. 85 A and 85 B).

After a straight edge is cut along the length of the two boards, they are taken out of the press, and one end of each board is marked for squaring. A carpenter's square is placed along the straight edge of one of the boards near one end Then dots are marked at each end of the blade of the square to indicate where the next cutting is to be done. The boards are then knocked up together on their straight edges, and with the marked board facing toward the knife, the two boards are lowered into the press as

before and placed so that the plough knife will cut through the two dots. To test whether the boards are accurately placed, the plough knife is run along and made to touch the marked board very lightly near the dots If it does not hit the dots, the position of the boards must be corrected.

After this, the length of the boards is cut. The length is determined as described for cutting by machine, and the square is used to mark the length in two places, as for the first squared end. The boards are knocked up and cut as before. Finally, the

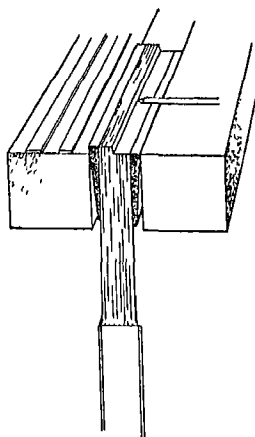



Fig 85 B.

width is marked on the boards, from the square placed at the edge, and this last edge is then cut

In order to test a pair of boards for squareness after they have been cut, the position of the boards is reversed and after they have been knocked up, any deviation will be shown. The inequality will be doubled by this reversing, and the boards should not be used but should be put aside for a smaller book

The English plough is made with a knife that fits into the bottom of the plough with a square bolt, whereas the French plough has a knife that runs through a metal slide in the bottom. Both

knives are fastened in a similar manner, by screwing down a nut at the top of the plough. The English press is of all wood and is operated by screwing up the jaws with an iron pin. The French press has iron screws which are operated by a metal wheel placed at the center on one side of the press. The guides for holding the plough are of metal, and the jaws of the press are topped with metal. Both styles of presses are shown in Fig. 1, A and B

Plough knives must be ground frequently and the bevels kept thinned, or the knives will not go through the boards easily. When used for cutting boards, these knives should not have too fine a point, as a fine point is liable to be broken off in board cutting. A slight rounding of the point is advisable for this work.

HOLING-OUT AND CUTTING BOARDS FOR LACING

HOLING-OUT. After the boards have been cut to size, they are holed-out and laced onto the book. To hole-out the boards for cords, one board is put in place with its double lining inward, close up to the joint and is adjusted so that it extends the same distance over the text at the head and tail of the book. In case of a book to be cut in-boards the board is placed with reference to the margins on the end paper which indicate the cut size of the book. The book is then laid on the bench with the top board in place and the back toward the worker. The frayed slips are brought over the back of the book so that the center of each one may be found and its place marked on the board near the joint. Then the board is removed from the book and placed on the bench. A pair of spring dividers is set to about three-eighths of an inch. One point of the dividers is held against the back edge of the board, and a line is made with the other point along the length of the board on its outer side.

A small try square (Fig. 86) is then placed against the back edge of the board at each point that has been marked to indicate

the center of the slips, and a line guided by the square is drawn with a pencil through these points at right angles to and crossing the three-eighths-inch line drawn by the dividers. Where these

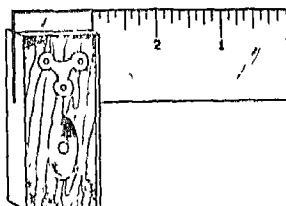



Fig 86.

lines cross indicates the points at which a hole is to be made through the board (see Fig. 87).

To make these holes (five in number, if there are five slips) the

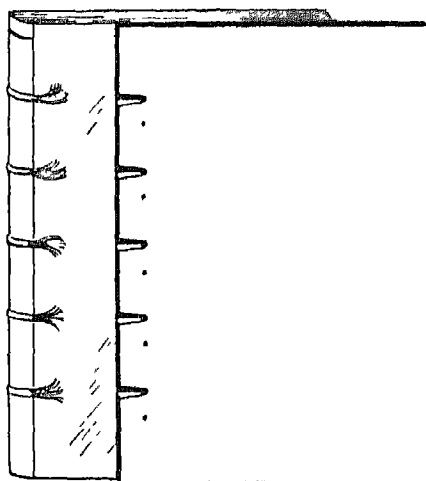



Fig 87

board is placed on a block of lead with a piece of cover board over it to prevent the bookboard from being damaged by the lead. A round-pointed awl is then used to punch the holes through the board. The awl should be struck firmly with the

backing hammer, making holes through the board large enough so that the slips may be passed through them. The board is then turned over and placed on the edge of the bench, with the holed-out side toward the worker, and with a sharp utility knife the material that has been punched through the board is cut off flat with the surface of the inside of the board

Then the dividers are opened about one full turn, and a line is drawn with them on the inside of the board near the previously made holes. Now another row of holes is punched through the board from the inside outward Starting from the head, a hole is punched on the line made by the dividers about three-eighths of an inch from the first hole and down toward the tail. A hole is likewise punched the same distance below each of the holes in the first row. This second line of holes will be a trifle beyond the first line, so that when the slips are laced through, they will come through on a slight angle. This serves to hold them more firmly than would be the case if they were pulled through on a straight line with the first holes. The board is then turned over, and the surplus material on the upper side is cut off. The second board is holed-out in the same manner.

GROOVING BOARDS FOR LACING. When the boards have been holed-out, grooves are cut along the back edge, into which the slips are sunk. Before this work is done, the boards should be put in place on the book to test the depth of the joint with relation to them. If the joint is too deep, so that it is higher than the boards, the fault cannot be entirely remedied at this time, but by tapping the back of the book over toward the board along the joint, the fullness is forced toward the middle of the back of the book, and the joint is made somewhat smaller. This increases the roundness of the back and is to be avoided if possible. It is usually better to wait until after the boards have been laced onto the book and then glue a piece of newsboard over the outside of the board.

Newsboard may be had in several thicknesses, and a thickness is chosen which, when added to the board of the book, will compensate for the discrepancy. This newsboard is glued, not pasted, for gluing warps less than pasting, and it is not desirable to warp the cover boards.

If a joint is not deep enough to equal the thickness of the board, a sandpaper block is run over the back edge of the board until it is made to conform in thickness with the joint. Care must be used not to make a sharp bevel along the board by this sandpapering. The bevel should extend far enough over the board so that it slopes very gradually toward the joint in order to avoid its being noticeable after the book is covered Sandpapering blocks of various sizes covered with sandpaper of different degrees of harshness are needed by the bookbinder It is useful to have a wooden stick, about eight inches long by three-quarters of an inch thick by one inch wide, covered on one side with a fine grade of sandpaper and on the other with a coarser grade. One or two blocks five inches by three inches by one-half inch, covered with different grades of sandpaper, are also useful. The sandpaper should be glued in place.

Now the grooving of the boards is proceeded with. This is done in the following manner. The slips are first freed of all glue and are thinned out, if necessary, to avoid their showing appreciably on the sides of the book after it is covered This thinning-out process requires some judgment. The slips should not be thinned so as to vitiate their necessary strength. It is desirable to have them show as little as possible on the outside of the covered book, but strength should never be sacrificed to appearance It is safe to thin down English cord somewhat, but with other cord one must beware, as the fibers are not too long.

I think the lacing-in method followed by mediæval binders is unnecessarily crude. If the sewing cord is made of hemp in long continuous strands, very few strands are necessary to hold the

boards firmly and permanently in place. Therefore, when a really fine English cord is used, it is safe to reduce it somewhat as it laces into the boards, and exaggerated lumps in the leather on the outside of the cover will be avoided, thus facilitating the tooling near the joint and achieving a more "finished" cover. However, I confess that I belong to the school of binders and bookmen that rather likes to have the structural features of a binding not altogether obliterated for the sake of making a surface for the designer of the cover to utilize for purely decorative purposes To my mind, the structural features of a binding, if not too obtrusive, are as significant as the decorative features and would better be turned to account in carrying out the decorative design than sacrificed to it

Once the slips have been freed of glue and are reduced in size according to the dictates of the binder, the cover board is put in place and the slips are brought over on it, one by one, in a line with the first punched holes Marks are then made on the board to indicate the width of each slip where it comes over the back of the book. These marks should be made close up to each side of the slip at the edge of the board, so that the grooves to be cut will not be wider than the slips. Then the cover board is removed from the book and is placed on the extreme front edge of the workbench with the slip marks toward the worker. A utility knife is placed on each slip mark, and the point is projected up to the outer side of the hole In this position, the knife is drawn sharply from each side of the hole to the edge of the board, and a groove is cut, of a depth sufficient to sink the slip as it is laced into the hole. The lines forming the groove should not converge at the hole and form a V, but should be the width of the hole at its extreme end, so that the thickness of the slip will not pile up into a lump as it goes through the board. It is obviously not possible to draw the slip through the hole without bunching it, unless the groove leading to it is as wide as the hole where the slip is pulled

through. Yet many hand binders persist in making this V-shaped groove for their lacing-in, and in consequence they are obliged to pare the slip down severely where it leads into the cover.

LACING-IN

Lacing-in Slips. When these grooves have been cut, the book is placed on the bench with the back toward the worker, and a quantity of medium-thick paste is worked thoroughly into the slips. After they are saturated with paste, they are flattened next to the back for the distance of about a half inch, and the ends are

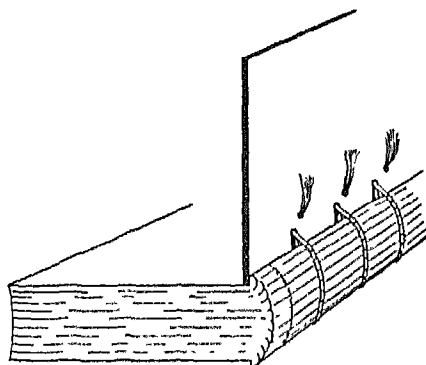



Fig. 88

screwed up as tightly as possible above the flattened part. The very tips of the ends are cut off on an angle to produce points that will permit the ends to be led through the holes easily. Then the book is turned so that the tail is toward the worker and the back is at the right, in order that the slips may be pushed through the board with the right hand and received inside with the left hand, which rests upon the book. The book is now turned around to enable the worker to lead the slips back through the second holes, using both hands for the operation. And then with the back toward the worker, all the slips are pulled up evenly and tightly, with the board resting next the joint at right angles to the side of

the book (see Fig. 88). This is in order to get the tension even on all the slips. The board is let down onto the side of the book, and it will probably yawn at the front To correct this yawning, the board is held half open and it is forced up into the joint. It should then lie flat on the side of the book when it is let down This process should be repeated on the opposite side of the book

The slips must next be cut off on the outside of the board close to the hole with a knife, and they are hammered flat on both the inside and the outside of the board For this hammering, the board must lie open on a flat knocking-down iron or a paring

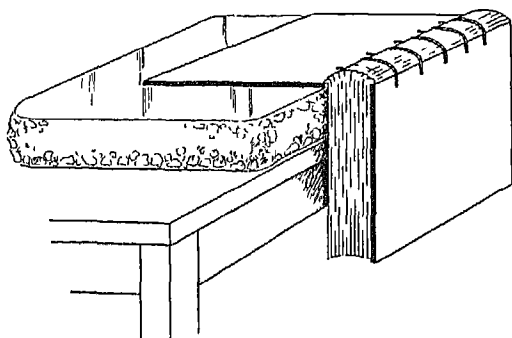



Fig 89

stone (see Fig. 89). Now the boards are closed and are pushed well up into the joints. With the fore-edge of the book held on the palm of one hand, the back of the book is pushed with the other hand until its contour is made symmetrical and the two joints are on a line with each other. With the book kept in this position, it is placed on the bench, and a covered tin is carefully inserted under each board and made to go close up into the joint, without disturbing the position of the boards Then the book is put in the standing press between covered tins and pressing boards, with the back facing out and with the boards on a line with the pressing boards and tins at the front of the press. This will ensure strong pressure on the back line of the boards and

force them down even with the joints. The book is left under pressure until the slips are dry.

To lace slips into wooden boards, holes are bored through the boards with a brace and fine bit. It is sufficient to make only one line of holes. After grooves have been cut out on the outside of the boards for the slips to lie in, the slips are led through the holes, and then wooden pegs are driven into the holes from the outside until the slips are thoroughly pegged in. The pegs are cut off on both outside and inside of the board, and any thin ends of the slips left inside are spread out, pasted and hammered flat. It is well to put some paste in the grooves and on the slips, as they may then be made to lie flatter.

LACING-IN TAPES. The principle of lacing-in tapes is the same as that for lacing-in slips, or cords. After the board is properly placed on the side of the book, with its double lining next to the text, a line of about three-eighths of an inch wide is made along the outside of the board, next the joint, with the point of the dividers. The tapes are then led across from the back of the book to this line, and their position is marked on each side of the tapes. Pencil lines are made to denote the width of the tapes as they run up to the line marked by the dividers along the length of the board These lines must be at right angles to the book-edge, and therefore, to make them, a try square is used across the back edge of the board.

Slits are made through the board the width of the tapes, on the line marked by the dividers To make these slits a utility knife is used. The board is placed on a holing-out block, the point of the knife is placed on the line to be pierced, and the end of the knife handle is struck with a hammer so that the board is cut through between the marks defining the width of the tapes. After the slits have all been made, the knife is pushed through them, and the ridges made on the inside of the board are cut off with a knife.

The board is then turned over, a second line is made along the back of the inside of the board about three-quarters of an inch from the edge of the board, and lines are drawn from each edge of all the slits to the line marked by the dividers. These lines are all marked at right angles from the back of the board by using a try square.

There will then be segments marked on the outside of the board running from the slits in the board to the back edge of the board. On the inside of the board there will be segments outlined in pencil running from the slits about three-fourths of an inch in from the back edge of the board. These segments on both sides of the board are cut out with the point of a knife to a depth equal to the thickness of the tape This will make little troughs formed to receive the tape when it is laced-in.

To lace-in the tapes, a little paste is put in each trough on the outside of the board, the underside of each tape is pasted where it will fall into the trough, and the tapes are then inserted into their respective slits by pushing them through with the point of a knife. They are pulled through the board tightly, and the board is then stood up on the book at right angles as for lacing-in cords, or slips (see Fig 88). Paste is put into the inside cutout troughs and the tapes are drawn across these troughs, and are pressed into them. With the board opened at right angles to the book, the tapes are cut off even with the ends of the troughs with a pair of shears, and they are pressed into place. Then, without disturbing the position of the tapes, the board is laid on the knocking-down iron or on a lithographic block with its inside upward, and all the tapes are gently tapped with a hammer. The board is turned, and the outside tapes are tapped gently The book is then ready to be put in the standing press where it is left until the tapes are dry. For pressing, directions should be followed as outlined for pressing a book laced-in with cords, as described on p. 157.

CHAPTER XII

FORWARDING

Cutting Edges In-boards Headbanding Bookmarkers

CUTTING EDGES IN-BOARDS

BOOKS are best cut in-boards with the plough, and the head is cut first. Before the book is put in the press for cutting, the plough knife should be sharpened to a fine point. The bevels on the upper side should be quite thin for book-edge cutting (see Fig. 90). The knife is sharpened on one side only, and the underside must be kept absolutely flat. The knife should be checked after being fastened into the plough, to make sure that it is running level. To test it, the cheeks of the press are slightly opened,

Fig. 90.

and the plough is screwed up until the knife comes over to the left cheek of the press It must then just clear the top of the left cheek, in order to cut a square edge. If it hits too far above the cheek, pieces of thin cardboard should be stuffed above the knife where it is held in the slot of the plough. If it hits below the press cheek, the cardboard stuffing must be inserted below the knife to raise it.

To cut the head, the two boards of the book are set in correct position, and then the front board is dropped down to the marks made on the end paper to indicate the place to be cut (see p 147). The boards are pushed up tightly into the joint, and a piece of binder's board is inserted between the end paper and the back board of the book so that the book will not be cut. A cutting board (Fig 91) is put on the back and on the front of the book even with the bookboards. The book is now lowered carefully

into the lying press with its back toward the worker as he stands at the end of the press, and it is adjusted to bring the edge of the front board, which is on a line with the cutting marks, perfectly even with the right cheek of the press. Then, if the book is held level as it is being put in the press, the top of the back board will

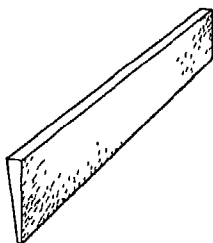



Fig 91

be the same distance up from the left cheek of the press as the top of the book is up from the right cheek. When the book is thus placed, the press is screwed up tightly, and after the knife is run up to the front marks in order to make sure that it will cut through them, the book-edge is cut as for cover boards (see p. 149).

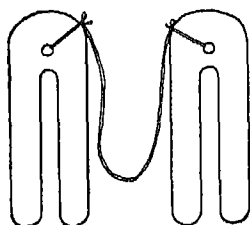



Fig. 92.

The tail of the book is cut in the same manner as the head, but the marks for cutting the length should be put on the back end paper, as the book must be cut with the back toward the worker, to prevent the sections from being crushed and chipped off at the joint. This makes it necessary to place the book in the press with the back board to the right of the worker.

Since the fore-edge is a curved edge, it is more difficult to put the book in the press for this cutting. First the protection sheets on each side of the book are cut off even with the edge of the boards. Then the spring dividers are set to the size of the square, and dots are made with a pencil on the end papers in from the

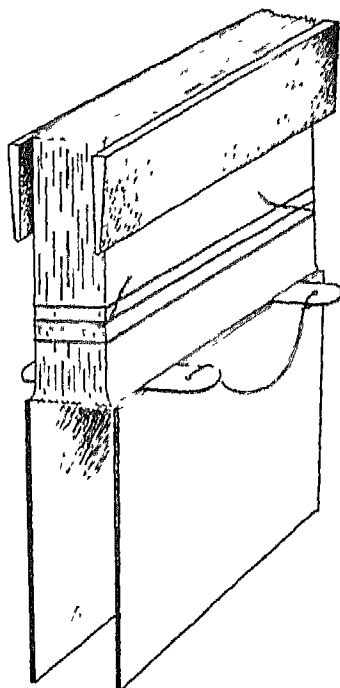



Fig 93.

fore-edge, to indicate this distance. These marks signify the amount to be cut off. The same distance is marked on the back of one of the cutting boards

The curved fore-edge will have to be made flat in order to be cut, so the book is knocked up flat at the back between its boards, and a pair of steel "trindles" (Fig. 92) are inserted so that they straddle the cords between the book and the back edge of the

boards (Fig. 93). If the book is very large and heavy, a piece of tape should be tied around the text near the back to prevent it from reverting to its rounded shape. A cutting board is then put on each side of the book. The back one, on which the dots are marked, is placed level with the edge of the protection sheet, and the front one is placed on the dots marked in from the fore-edge to indicate the amount to be cut off. The book is held firmly by the cutting boards, and the trindles are removed. Then the book is put into the press and is placed so that the edge of the lowered

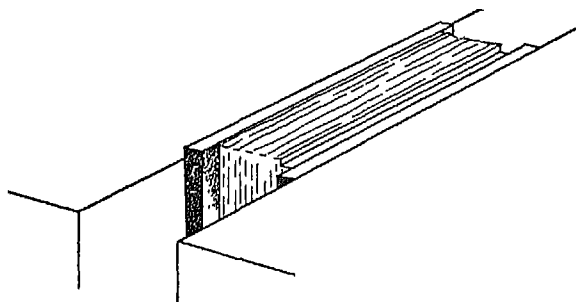



Fig 94

cutting board is even with the right cheek of the press and the top of the opposite cutting board is above the press, with the dots on it even with the cheek of the press (see Fig. 94).

After the placement of the book is checked and before the cutting is begun, the back of the book should be inspected to see that it has remained flat. If it is not perfectly flat, the book must be taken out and put in again correctly. When the book is satisfactorily placed, the press is screwed up tight and the fore-edge is cut in the same manner as the head and tail edges.

HEADBANDING

"Headband" is a term used to designate the strip of material at both the head and tail of a book which has threads, usually of silk or linen, woven over it. The headbands are made to fill the

space on the back of a book that is lower than the board edges. If it were not for filling in this space, the leather at the back would be crushed when the book is pulled from the shelf There are various types of headbands made on books. In mediæval times these bands were worked onto the book over strips of leather or vellum as the sewing was done, and their ends were left long and laced into the boards on each side of the book (see Fig. 95). This is a clumsy method of headbanding and does not admit of converting this structural feature into a decorative one. The modern

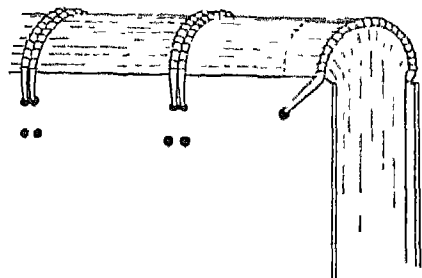



Fig. 95.

headband performs its function quite as well and allows the binder the opportunity of introducing color and a pleasingly woven band at head and tail.

Headbanding Material. Most binders use cord, catgut, or pieces of leather or vellum strips for headband material. When cord is used, it is prepared by sticking a length of cord into the gluepot and then hanging it up with a heavy weight on the end to allow the surplus glue to run off and the glue remaining on the cord to dry. Weighting the cord stretches it so that it will not buckle up during the drying process. After it has dried, it is sandpapered down so that it is of even surface and uniform thickness. Cords of different thicknesses are prepared in this way, and when needed, pieces are cut off for the headbanding. Leather or vellum is used in cut strips, sometimes pasted to-

gether. A material that I consider superior to any, if a flat headband is desired, is made up by pasting a piece of newsboard between two pieces of postcard board. After being pasted, it is left under a weight to dry Pieces may be made of various thicknesses by adding extra newsboard or by increasing the weight of all the boards This material is made up in large pieces, and strips are cut off it for the headbands The advantage of this kind of material is that it is more pliable than catgut or vellum and is firmer than leather After strips have been cut for use, the layers composing them should be pulled apart and be freshly pasted together again in order to allow them to be shaped to the contour of the back of the book without cracking. This shaping is done by curling the strip over a folder edge Glue must not be used in making up this material, for if used the pieces would peel apart and the material when made up would be less supple The French binders use pieces of rolled paper in various thicknesses. These should be moistened with a little thin paste and then left until nearly dry before being shaped, as otherwise they are liable to crack in the shaping process. Colored silk or linen thread is usually used for weaving over the strips.

The extra binder always fastens his headbands to the back of a book by running the thread down through the sections as he weaves it around the band material Job binders use headbands that are previously fabricated, and merely glue them onto the back of the book. These have very little functional value.

Two-colored Double-wrapped Headbands The two-colored double-wrapped headband may be made quickly, and it presents the most attractive decorative effect of any headband made in so short a time.

Before the work of headbanding is begun, a strip of headbanding material is cut for the head and tail of the book the width of the book-squares if the banding is flat, or if it is round, a size is

chosen which will fill up the distance between the edge of the book and the length of the boards. These strips should be about one-half inch longer than enough to encircle the back of the book, and they must be shaped to the contour of the back of the book.

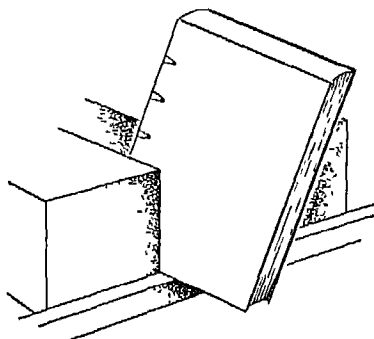



Fig. 96

The book is then put in a finishing press forward of the first screw, with the fore-edge placed toward the worker and slightly tilted downward, in order to keep the head from riding up as the headband is being made (see Fig. 96). Then two strands of silk,

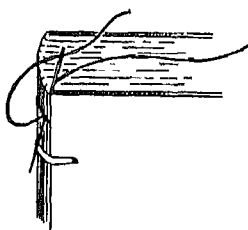



Fig 97

or other thread, of different colors are cut and tied together at one end Each color is threaded through a milliner's needle (which is long) at the opposite end of the knot, and the two threads are spliced in order to hold them in the needles while the headband is being made (see p. 120 for splicing).

One threaded needle is now inserted from the front of the book toward the back (see Fig. 97) through the inside of the end-paper section at the left of the book, and is passed between the second and third leaves of the section, counted from the outside. It is pulled out through the back of the book just under the kettle stitch, and the thread is pulled through the back of the book its full length, with the knot left inside the section. It is now brought back to the front of the book, and the needle is pushed through the book again in the same place, thus forming a loop The

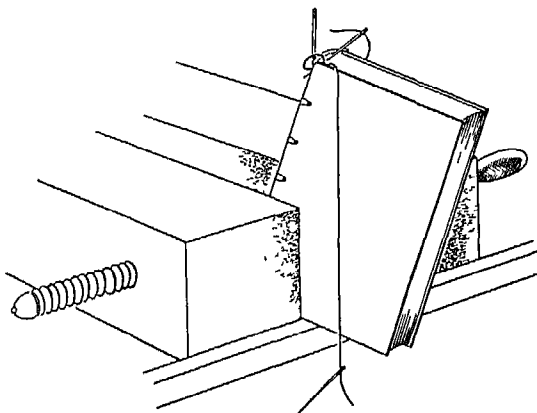



Fig. 98

headbanding strip is inserted into the loop, about a quarter of an inch is allowed to extend beyond the back on each side, and both threads are then pulled up tightly (see Fig. 98). The strip must be held from slipping over the back of the book by placing a needle back of it, sticking vertically into the book. The first thread, which we will call white, is brought up over the back of the book, and the second thread, which will be called blue, is crossed over it from left to right, forming a bead on the top of the book It is then brought down under the headband strip to the back of the book and up over the strip to the front. It is led down again under the strip and brought up again to the front, thus en-

circling the strip twice The white thread is crossed over the blue thread, forming another bead (see Fig. 99), and this procedure is repeated all the way across the back of the book. The beads should be kept evenly tightened, and they should be made to rest along the top of the book-edge

At intervals during the headbanding process, the thread must be tied down, or "anchored." It is necessary to anchor it only where the back curves or when the bandstrip is not easily held in

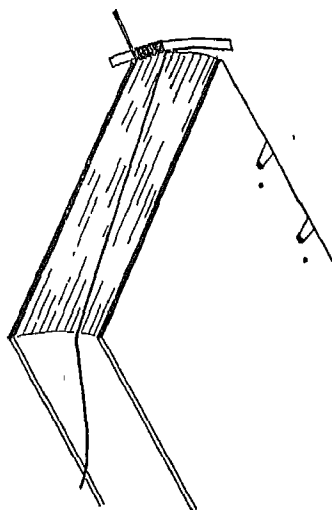



Fig 99.

place — about four or five times for a mediumly thick book. Mediæval headbands, which were sewed with the book, were anchored with each section, but this is unnecessary, for a headband is sufficiently strong if anchored every three or four sections. To anchor the headband, the thread is not wrapped around the bandstrip, but after it is brought up from the back, it is merely brought over the strip, and the needle is pushed from the front down through the inside of the section on a line with the last stitch and then pushed out at the back under the kettle stitch.

The thread is pulled up tightly and is brought again over to the front, where the other thread is made to cross it and form a bead. The headbanding is continued as before When finally the right side of the book is reached, the two threads must be anchored twice, as they were at the beginning. The thread at the back is brought to the front over the bandstrip and is pushed down through the last end paper between the second and third sheets and under the kettle stitch. It is brought up again over to the front and pushed down again, so that it comes out at the back, where it will remain. The second thread is then crossed over it to form the last bead, and is brought under the band and down the back, where it is tied with a secure double knot to the first thread under the kettle stitch. Both threads are then cut off and frayed out. A little paste is put on them and on the knot, and the knot is pushed in between the sections at the back of the book. The ends are smoothed out with a folder and made to lie flat.

When the headband is finished, the ends of the bandstrips are cut off close to the silk. Each end is tinted with a water-color paint which matches the colored silk next to it, so that the headband will not have an unfinished appearance. The beads on this headband will be of alternating color, a white bead over the blue thread and a blue bead over the white thread. These beads should rest evenly across the edge of the book, and if any are inclined to ride up, they should be pushed down with a folder until they all align

In making the headband, the two hands holding the thread should be drawn away from the book as the thread comes over the back and then they should be worked back up toward the book as the crossing thread is led under the band. During this operation the left first finger should be placed where the bead is being formed. A certain rhythm must be maintained in the working, in order to keep the tension of the threads even while the beads are being made The left and right hands are alternately

drawn forward and backward on the thread as the banding proceeds, so as to control the tension.

The headbanding must not be carried too far over to the right, for then the band will be too long, and when the book is covered, the headband will not have sufficient space in which to lie evenly and will push out at the back. A good way to test the length is to press the boards on the sides of the book together firmly at the headband and then note how far the thread should come when the book is in this position, for this is the position the back of the book will take after the book is covered.

Headbands of one color may be made in this same way, if desired, though it is not necessary to knot the thread as for two-colored bands. This method produces a large bead, and the solid-colored headbands have a more attractive appearance if made without wrapping, since then the bead will be smaller.

SINGLE-WRAPPED HEADBANDS. To make headbands of one solid color or of two colors, with a single wrapping, the same procedure is followed as for double-wrapped headbands except that the beads are made after the back thread is brought over to the front, without wrapping it around the bandstrip The beads, if two colors are used, will be first of one color and then of the other For example, if blue and green threads are used, a blue bead will be made over the green thread, and a green bead over the blue alternately to the end of the headband.

MULTICOLORED HEADBAND. A headband may be made of several colors, and there may be stretches of one color after another, either equal or unequal in length. For instance, if a headband is to be made of a light-green, a blue, and a dark-green thread in stretches of five threads of the light green and blue at the beginning and end and a longer stretch of dark green in the center, the worker proceeds as follows: The light-green and blue threads are threaded through milliner's needles, and they are

tied together at the other end. The needle with the light-green thread is inserted from the front of the book through the back and is brought up over the bandslip, which has been previously shaped to the book, and inserted again in the same place, thus forming a loop, as described for making two-colored double-wrapped headbands. The light-green thread is brought over the slip to the front, and the blue thread is wrapped around it completely from left to right to form a blue bead. Then the green thread is led under the slip and is brought up over it again, and the blue thread is wrapped around as before. This is continued until five strands of the light-green thread are laid over the top of the slip, with beads of blue thread made along the top of the book. When this is done, the blue thread is wrapped around the slip five times, and beads of green are formed The two threads will then both be in front of the slip. A strand of dark green is threaded into a needle and is tied onto the light-green thread about one-half inch from where the last blue thread bead was made, and the ends of the two threads are cut off. (This severs the remaining strand of light-green thread.) The blue thread is then wrapped entirely around the dark-green thread from left to right, the needle of the dark-green thread is inserted through the front of the section on a line with the last wrapping, and after coming out at the back of the book, it is brought up over to the front, and the blue thread is crossed over it as before This is continued for as great a distance as has been planned for the stretch of dark-green thread. The light-green thread is then attached to the blue thread in the manner before described for attaching the dark-green thread, and the five blue and five light-green wrappings are made to correspond to the first five ones, up to the end of the book, when they are anchored and finished off as were the previously described headbands. The headband should be anchored at intervals as it is being made (see "Two-colored Double-wrapped Headbands" for anchoring). Any number of colors

may be used in this manner, and the color spacings may be varied or kept even, as desired. Calculation must be made, after the first segments of the band are finished, in order to determine how long to make the center segment.

HEADBANDS OVER DOUBLE STRIPS. Headbands may be made over double bandstrips, cut either from round or flat material. I will describe two kinds of double headbands — the first an English type, and the second a double headband called "tranchfille chapiteau," made by the French extra binders.

The English type is made over either round or flat strips, and the pattern of thread, as it winds over the strips, forms a figure eight. The thread is of a single color. The lower strip, which is the larger, rests on the leaves of the book, and the second strip is placed on top of it toward the back of the book. If the strips are round, the lower one is generally made of glued cord, which is covered with leather. (This leather is pared very thin and is either glued or pasted around the cord.) Small cello string is used for the upper cord. The strips are cut long enough to reach across the back of the book, with about one-half inch added They are shaped to the book and are tied together at the left end, the smaller one resting on top of the larger. The thread is doubly knotted at one end, so that it will not pull through the sections, and it is threaded at the other end. The needle is inserted through the leaves of the end-paper section from the front to the back of the book, and the thread is pulled through the book until the knot rests in a fold of the section. The two tied cords are then placed on top of the book and are held in front by the square of the board and in back by a needle which is pushed down back of them vertically into the back of the book on the left side. Now the thread is brought up from the back between the two cords and is inserted through the back of the book again from the front, forming a loop which ties down the larger cord. It is

brought up from the back again between the two cords, is led over the upper cord from the front, and is brought out between the cords to the front again, thus completing a figure eight. Then it is passed under the lower cord, brought out from the back between the cords, and wrapped around the upper cord as before, forming another figure eight. The thread continues to be formed around the cords in figure eights across the edge of the book The headband is tied down at the right end by securing the larger cord in the usual way and then the smaller one The end of the thread is cut off after it comes out of the back of the book and is pasted down. It may be noticed that no beads are formed in this type of headband.

The two cords are tied down, or anchored, alternately and frequently as the work progresses The large cord is tied down by bringing the thread up over it and then inserting the thread from the front to the back of the book before it is wrapped around the smaller cord. The smaller cord is tied down by bringing the thread up from the back between the two cords, then around the smaller cord, and down in front of the larger cord, when the thread is inserted from the front of the sections. The thread, when it comes from the back, is always brought over the larger cord, and never under it, in making this headband. The English also make a double headband, with a bead finish similar to the French one

The French double headband is more complicated than the English one without beads. It is made of two colors of silk thread, over cords of rolled paper of different sizes. After the cords are cut to size and shaped, the larger cord is anchored with the first thread, as for other headbands. Then the second cord is placed on top of it and is tied to the larger cord The first silk is brought up from the back under the top cord, is wrapped around it, and is brought out to the front between the two cords The second thread is then crossed over the first one to form a bead. This pat-

tern of weaving the thread around and between the cords is continued across the book. The headband is tied down frequently, like the double headband previously described, and it is finished off at the end in the same way as the other double headband.

BOOKMARKERS

Prayer books and books of devotion usually have one or two silk ribbons, called "markers," put in them to assist the reader to mark special places in the book. These markers must be attached to the book after the headbands are made and before they are "set." The French manufacture thin silk ribbons, called "signets," for this special purpose, and they may be had in many and variegated colors. In order to fasten them into a book, lengths are cut off one and one-half times the height of the book and are pushed under the headband from the front, with a short end left at the back. This short end is pasted or glued to the back of the book, and the long portion of the marker is led between the sections opposite to where its end is affixed to the back of the book. It is folded over inside the section so that none of the marker extends beyond the tail of the book.

CHAPTER XIII

FORWARDING

Lining Up Back Hollow Backs Casing Text in Protective Cover

LINING UP BACK

IF the back of the book has not had the surplus glue cleaned off and the bands straightened and made equidistant, this work should now be done (see p. 142) before the lining up. The head-bands should also be "set" by inserting a little hot glue between them and the back, in order to make them a firm extension of the back. After the glue has been inserted, each headband is shaped to the book and is held firmly in this position while the glue is drying. Both the setting of the headbands and the cleaning of the back are done with the book in a finishing press

Preliminary to lining up, it may be necessary to attend to correcting some irregularities on the back. If the binder has been unable to back a book without splitting the sections from one another, the cavities between the sections should be filled before the back is lined. For this purpose, lengths of frayed-out cord permeated with paste may be put in the crevices of the back and smoothed out. When the tail edges are left very rough, there will be open spaces under the headbands, and these must be filled in. A very satisfactory material to use for filling in these holes is a filler made up of coverboard scrapings. To make this, a piece of board is scraped with a knife until some powdery material is collected. These scrapings are then mixed with paste until they form a smooth compound This is then put into the holes with a pointed folder and is smoothed off even with the back. Another useful stuffing for inequalities on the back of a book is made by snipping very fine particles off a piece of cord and making a pulp by mixing them with paste. This is the better compound to use in the finer patching.

After these preliminary things have been done, a small piece of thin kraft paper or other thin stout paper is glued over the back of the book to cap the headbands and the headband threads lying on the back. This paper is cut the exact width of the back from board to board and cut long enough to extend over the threads and beyond the edge of the headband. It is first dampened with a small sponge on both sides, then glued, and put in place. After it is well rubbed down with a folder, the book is taken out of the press and turned over so that its back rests on the workbench. In this position, the headband may be pressed down firmly against the paper, from the front Then with the shears the paper is cut off even with the top of the headbands. It can be more easily and accurately cut before the glue is hardened by drying, and the cutting is best done with the fore-edge facing the worker. After it has thoroughly dried, the paper is sandpapered down. All the high spots produced by the thread are leveled by this sandpapering, and they should be sandpapered off entirely even, down to the thread, if necessary. Dampening the paper and gluing it instead of the book causes the paper to stretch, and after it is dry, it shrinks and makes a tight union with the back.

It is a general practice to line up the backs of books before covering Lining up produces a back devoid of irregularities and makes it more solid for tooling. Binders vary in both the methods and the materials they use for this process The French binders are prone to line a back up heavily so that they may lavish their expert tooling on its surface after it is covered in leather. They use split leather or paper for this purpose and often glue on several thicknesses of either, or both, of these materials. This heavy lining up results in making not only a solid back for tooling, but unfortunately, a stiff back, which prevents an easy opening of the book. While some lining up is advisable, both for the sake of appearance and for making a surface suitable for titling and decorating, it is certain that lining up does not contribute to the prac-

tical functioning of a binding. This should be borne in mind by the binder and should influence him to line up as little as possible.

One lining paper hardly suffices to make an even and sufficiently solid back for tooling, for most of it has to be sandpapered off in order to take down the high spots. It will be found that if a lining of meshed cloth, called "super," is glued over the back, it will be unnecessary to use so many thicknesses of paper. This makes for a more supple back, and the meshes of the cloth serve to conceal the irregularities of the back, so that little sandpapering has to be done after the paper is added. Super, in my opinion, is superior to muslin or the English jaconet for lining up backs, because the meshes of the super clinch the glue to the back, whereas the muslin, being a solidly woven material, is stiffer and cannot be made to conform to the back and make as close a union with it as the super. This "clinching" is very important in joining materials, as is demonstrated in cement work, where a meshed wire is placed over one layer of cement to clinch it to the next layer.

The lining for a back is cut the exact width of the back. This measure is best taken by using the straight edge of a small piece of paper and marking the width on it, as the surface is round and cannot be measured with dividers. The length of the back lining for a book sewed over cords is cut to go between the cords except at head and tail The material which goes over the headbands is cut to project beyond them Super is cut on one of the threads of the squares, and the length should be cut to line with the selvage on the width of the material. When books are sewed on tapes, the first lining is cut in this way, but the upper linings are cut the width of the book and a little more than the full length of the back.

If a book is to be lined up with super and then with paper, a thin strong paper is used for the upper linings After the linings are cut, the book is taken in the left hand and the back is glued

over its entire length with thin, hot glue, with care taken at head and tail to spread the glue toward the ends, so as not to soil the headbands. If there are cords, care must also be taken to avoid spreading glue over them The book is put in the press, and without delay the pieces of cut super, which should be laid out on the side of the press in proper order, are placed and are rubbed down with a folder. Attention must be given at the headbands to make sure the super is adhering to them. Then the book is removed from the press, and the super extending beyond the head and tail is cut off even with the headbands. Next the paper linings are glued on. First the paper is moistened with a sponge on both sides. It is then glued, put in place while the book is in the press, and rubbed down firmly. At head and tail it is cut off to line with the headbands, as was the super. The lined-up book is then left to dry for perhaps a half hour, when any irregularities on the back are sandpapered off with a sandpaper block (see p. 154). If the surface of the book is irregular after being lined up once with paper and sandpapered, another lining paper may be added, though it is well to bear in mind that each extra lining paper adds to the stiffness of the back.

HOLLOW BACKS

When the backs of books first began to be elaborately gold tooled, a solid surface was found to be necessary under the tooling in order to prevent its being cracked when the book was opened and closed In consequence, backs of books were lined up many times and were made solid and stiff Binders at that time were apparently more concerned about the perfection of their tooling than about the practical features of their book construction.

As increasing complaints came from the bibliophiles because their books would not open freely, binders were finally forced to seek a way to correct the fault. Still bent on not sacrificing the

appearance of the book, they resorted to sawing through the back to sink the cords around which the sections were sewed, and they devised a change in the structure of the back. This change represents the invention of the hollow back

Hollow backs are a debated subject among binders. They certainly have their use and offer a solution for overcoming a stiff opening of a book caused by the fault of the printer or the typographer. When a book is printed on stiff, thick paper, if it is ex-

Fig 100 A.

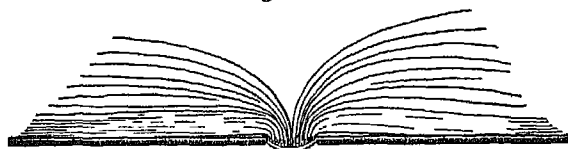



Fig 100 B.

Fig 100 C.

pected to open properly, the sections should not be made up in a format that necessitates folding the printed sheets too many times, thus producing thick, stiff sections. No binder can bind this type of book so as to prevent entirely the leaves from fighting back when the book is opened, without sacrificing the book structure. The leaves will persist in standing up in the air and will not lie flat if the sections are sewed flexibly around cords. So it is that the binder has to do his best to bind such books in a manner that will overcome the gross fault in the "make-up" of the book, and he employs a hollow back for the purpose. Figure 100 A illustrates the manner in which the leaves of a book are allowed to

open freely and lie flat when a hollow back is used. Figure 100 B illustrates a book printed on stiff paper and sewed flexibly over cords. Figure 100 C shows a book made up in a format suitable to the paper and sewed flexibly.

Bindings with hollow backs forfeit the soundness of construction of bindings in which the leather is pasted directly to the actual back of the book. A hollow back is a false back. It is made of layers of paper formed like a tube with a hollow center and is glued onto the real back of the book. The leather is attached to it, and not to the book sections. Hence, if the leather is broken at the joint or is disintegrated through rotting, the false back falls off the book. If the leather is broken at the joint on a binding in which it is pasted directly to the back, the back is in no way injured.

Nevertheless, when a free opening is expected, the binder is compelled to use a hollow back if he is called upon to bind a book made up with a faulty format inconsistent with the useful functioning of a binding. This does not mean that binders should blindly espouse the cause of hollow backs and use them indiscriminately and habitually, for no matter how they are affixed to the back of a book, hollow backs still remain false backs.

When hollow backs are used, the back of the book should first be lined with super, and usually a strong thin paper is glued over the super. If the book is very small, this paper may not be needed. If it is large and heavy, it may need two lining papers over the super to give the back solidity and strength. Even a piece of split leather might be required for lining a very heavy book bound with a hollow back. Blankbook and account book binders, called in England "vellum binders," employ the hollow back in their work, and the best "vellum binders" line up the backs of their books with leather. Hollow backed books are customarily sewed on tapes or on sunken cords, in order to attain a smooth back, though sewing on sunken cords is not a good practice. Some of

the German binders are attaching hollow backs, made after the English model, to books sewed over raised cords. The construction is identical in both instances. The French hollow back differs from the English one, very materially.

ENGLISH HOLLOW BACK. To make a hollow back after the English model, the hollow is usually made directly on the back of the book. A piece of heavy wrapping paper is cut with the grain running with the width of the paper. It should be cut a

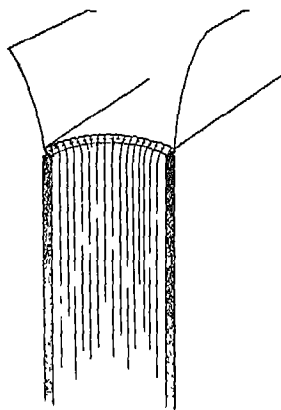
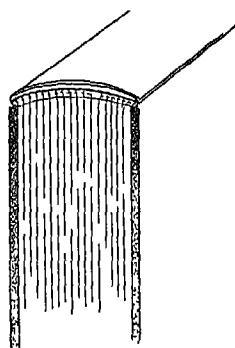



Fig. 101 A Fig 101 B.

little longer than the book and wider than enough to extend over the back three times. One straight edge of the width is placed on the back at one joint, and the distance across the back is marked from joint to joint. The full length of the paper is folded to this distance. The same distance is marked again on the paper, and it is folded a second time. This distance is marked off the third time, and the paper is cut on the marks.

The back of the book is glued, and the center part of the folded paper is placed on the back and is rubbed down thoroughly (see Fig. 101 A). Then a piece of wastepaper is placed under one of the free parts and that part is glued. The third part is folded over the glued paper and is well rubbed down. One thickness of the

paper will be glued to the book and two other thicknesses will be glued together, to form a hollow (see Fig. 101 B). When finished, the hollow back is cut even with the headbands at head and tail. For most books it is desirable to add one or two layers of paper over the hollow. This makes the hollow stiffer and does not add to the stiffness of the opening. A hollow back should not be put on a very thin book, for there is too little to glue to, and it does not make for a substantial construction.

French Hollow Back. There is a type of hollow back much used in France that is peculiar to that country. It has the advantage of greater strength than the hollow back just described, because it is carried over beyond the back and is attached to the end papers of the book; but since the cover boards cannot be laced onto the book, this advantage is nullified. It is not suitable for extra bindings, as the paper that is covered over the back makes a ridge under the pasted-down end papers on the inside of the book unless double boards are used.

A book with this hollow back is sewed on tapes, and super or cambric, which is cut even with the headbands, is glued over the book and is allowed to extend beyond the back for about an inch on each side. A paper the width of the back is lined over the super and is cut at head and tail even with the headbands. Then a piece of chipboard is cut the exact width of the back and the length of the bookboards, and a piece of wrapping paper is got out somewhat larger than the chipboard and wide enough to go over the back of the book and extend onto the sides for about an inch. The chipboard is glued to this paper and is centered when put in place. If single boards are to be used, the super and the tapes extending over onto the sides of the book are pasted down onto the end papers and are shaped into the joint. In this case, the chip board is put in place on the back, and the paper extending over it is pasted down on the end papers and is worked well into the

joint. The book is then put in the press until the paste is dry. If double boards are used, the lower, or thinner, board is cut to size and is put in place on the book. The paper, together with the tapes and super, are lined down on it, after which the upper board is glued onto the lower one.

This type of hollow back is especially suitable for books with double boards, and it is used for limp-covered books, such as prayer books The French use it for books bound in "Bradel" fashion, with a French joint.

Before the covering is done, all hollow backs are slit up at the joint for about three-quarters of an inch at head and tail on each side of the book, so as to allow the leather turn-ins coming over the back to be tucked in under the hollow. It is best to slit the back just before the covering operation, as it is likely to curl if exposed to the air too long after being slit.

CASING TEXT IN PROTECTIVE COVER. To protect the edges of a book from being soiled with paste when covering, the text is cased in paper. A piece of wrapping paper is cut large enough to wrap the length of the text completely, with a small overlap The width is about twice that of the book The book is laid on the workbench with the fore-edge toward the worker, the underboard closed, and the upper board lying open. The paper is placed between the lower board and the text, well up to the joint. It is folded over and creased sharply on all three upper book-edges. The book is turned over and the other three edges are creased likewise. Then the creased paper is taken from the book and is cut as shown in Fig 102 A. In this diagram the dotted lines indicate the folds; the solid lines indicate the boundary lines of the cover and all lines on which the paper is to be cut. Figure 102 B shows the protective cover after it has been cut In this diagram the dotted lines represent where the paper is to be folded as it is put in place on the book. As the book lies flat on the work-

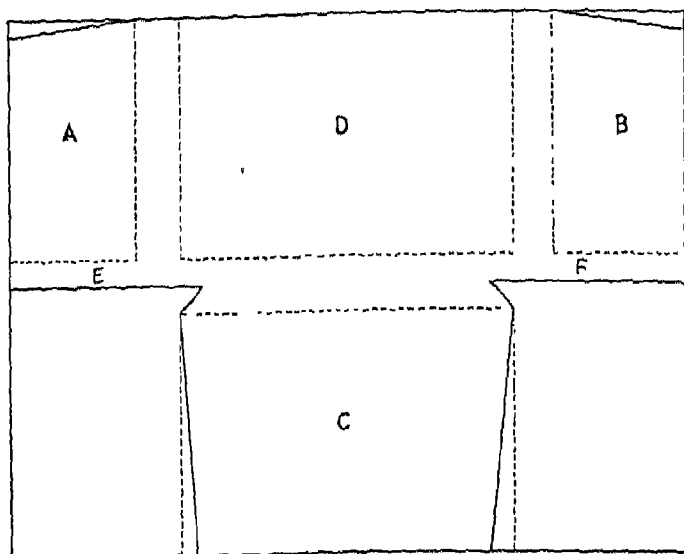



Fig 102 A.

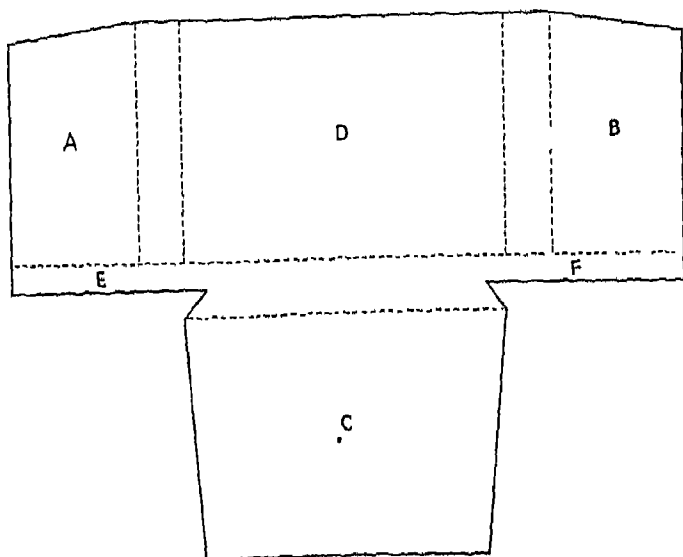



Fig 102 B.

bench, one side, D, of the protective cover is inserted between the lower book cover and the last end-paper sheet until it reaches the joint of the book. Pieces A and B, which are cut to reach not quite half across the book, are then folded over onto the upperside of the book and are firmly creased in place. The tabs E and F are folded over the fore-edge and creased, and piece C is brought over on the upperside of the book and is well creased along the

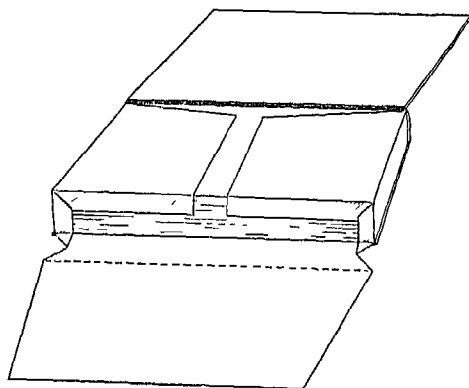
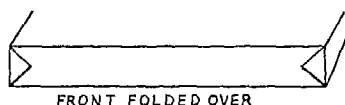



Fig 102 c.

fore-edge One or two daubs of paste are put under piece C, which is then made to adhere to the folded-over pieces A and B This paper casing must be put on neatly so that the squares of the book will be visible when the book is being covered, and all creasings must be very definitely made, both when the casing is being put on the book and when the pattern is being blocked out The manner in which the tabs are folded over at the fore-edge corners is shown in Fig. 102 C. For a half binding this type of protective

case is not necessary. The covering does not need to extend over the fore-edge of the book, hence a strip of paper is cut the width of the book and long enough to encircle it completely. It is joined on one side of the book

CHAPTER XIV

FORWARDING

Patterns for Leather Covers Cutting Leather Covers. Facts Related to Paring Paring Leather Paring Paper

PATTERNS FOR LEATHER COVERS

BEFORE leather is cut for a book, a paper pattern is made for the size needed Good leather is expensive, and a full skin can be utilized most economically if cover patterns are laid over it. Calculation can then be made accurately as to where to cut a cover to the best advantage, and the time used for cutting these patterns is more than paid for by the saving of leather.

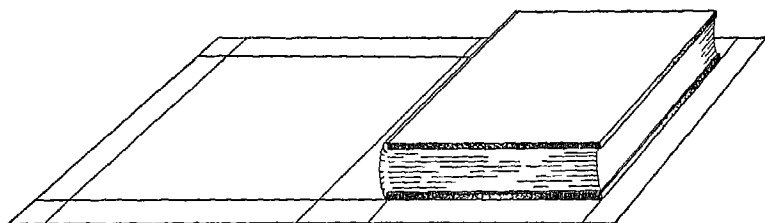



Fig. 103

PATTERN FOR FULL LEATHER COVER To cut a pattern for a full leather cover, a piece of wrapping paper is cut with one edge squared to another. The closed book is laid at the squared corner of this paper, and allowance is made for about an inch projection of the paper beyond the book board at the fore-edge and at the two ends of the book. A line is drawn around the board at head, tail, and fore-edge, as the book lies in this position (see Fig 103). Marks are made to indicate the back line of the board, the book is removed from the paper, and a straight line is drawn through the marks This gives the boundary lines of one board. A measure of the width of the back is then taken from cover to cover with the straight edge of a piece of paper, and the distance

is marked from the back line of the board A line is drawn through these marks, and the back board of the book is placed on it, so that the fore-edge board line may be drawn. An inch is allowed beyond this line of the fore-edge, and the paper is squared through the line in order to get the length of the leather needed to go round the book An inch is added beyond the marked length of the board, and the paper is squared through this measure to get the required height. This completes the paper pattern

PATTERN FOR HALF LEATHER "Half leather" is a term used in a generic sense to denote both half and three-quarter bindings, though the professional bookbinder technically refers to these two types of book in specific terms, calling a half binding one on which the leather at the corners and over the sides of the book is not so expansive as that used on a three-quarter binding. There is a convention observed among binders in respect to both half and three-quarter bindings about the proportion of the leather on the sides to the over-all width of the boards, as also about the size of the corners in relation to the width of the leather next the back.

For a half binding, the side of the board is divided into four parts with the dividers, with the last division left about one-half inch short of the others This width is marked on the side of the board next the back A piece of wrapping paper is squared as for whole leather patterns, and about five-eighths of an inch over the length of the board measure at both head and tail is allowed, and the length of the leather is indicated The paper is squared to this length. The distance decided upon for the width of the leather covering the sides is doubled and marked on the paper Then the width of the back is added About one-quarter of an inch also is added, and the paper pattern is cut for width This finishes the pattern for the back and sides of the book

To measure for a three-quarter binding, the side of the board

is divided into three parts, with the last division left one-third smaller than the others. This distance is marked on the board near the back, and the leather pattern is made as for half bindings.

It will be found that if these rules are followed, there will always be a pleasing proportion of leather on the book sides. Amateur binders who are anxious to make the binding as elegant as possible and who are not informed about these conventional proportions often turn out half bindings with an overheavy amount of leather on their sides However, these proportions may be altered with impunity if a large-figured paper is to be used on the sides of the book The width of the leather strip on

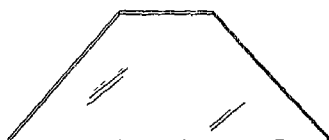



Fig 104

the sides and also that on the corners should then be reduced, or the large figures in the paper will look grotesque.

Every binder has a set of corners cut out from millboard if possible, or if this is not available, then of any binders cover board These corners are cut in the form of an isosceles triangle, with the sides of even length squared to the corner They range in size from very small ones to large ones, and each one is about one-eighth of an inch larger than the other. These triangles are usually numbered, and they represent the measuring instruments for determining the size of the leather corners to be put on the book. There must be a counterpart, which is used as a leather pattern, for each triangle The counterparts are cut with about five-eighths of an inch allowance on the two squared edges, and they have the end of the triangle cut off (see Fig 104) They are numbered to accord with the numbers on their respective triangles. There is a corner measurer made of metal which saves

the trouble of making all these patterns, but so far as I know, it is not found except in France.

CUTTING LEATHER COVERS

The best part of a skin is near the backbone. The part bordering the side edges, which is that part over the flank and belly of the animal, is considerably softer and is usually not as clear and even in color It does not matter whether the leather for a book is cut running up and down or from the center to the side of the

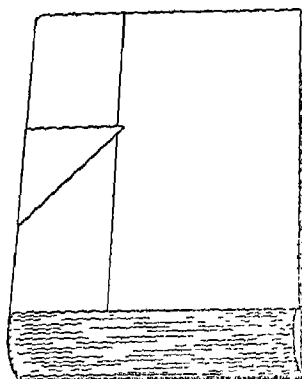



Fig 105

skin, except from the viewpoint of economy If the backbone is used, it will be less conspicuous if it runs down the middle of the back of the book, though with very small, thin books this is not advisable, as the leather on or near the backbone is very stiff. The larger the skin, the thicker it is, and if a large thick skin is used for small books, it will have to be pared down so much that its strength is injured. Hence, it is desirable to use small skins for covers of small books Many binders always buy large skins because they are more economical than small ones, but this is a doubtful practice. A few small skins of different colors should be on hand for use for small books.

After the pattern for a full binding has been made, it should be laid on the skin, and with due consideration to the usefulness of the smaller parts of the skin for half bindings, the pattern is cut against a straightedge with a knife, on a tin or zinc.

Half-binding corners are cut out of any part of the skin left after cutting full-binding and half-binding covers. The corners

Fig 106 A

of a half binding are usually cut from the edges of the skin, with the corner-cutting patterns used for a measure. In order to determine the proper corner pattern to use, a measuring corner is placed on the side of the board with one squared edge up to the joint (see Fig 105). When a corner is found the squared side of which measures about one-quarter of an inch beyond the meas-

Fig 106 B

ure marked for the width of the leather on the side of the book, it is the proper-sized corner for the book. When the counterpart of this corner, which is numbered, is found it is used as a pattern for cutting the leather corners

FACTS RELATED TO PARING

Paring Knives. There are two types of knives used for paring, one known as the French paring knife, which is usually slightly rounded at the cutting end (see Fig. 106 A), and the other, a knife with the end cut on an angle (see Fig. 106 B). The

so-called French paring knife originated in France, though it has been adopted for use by most extra hand binders. It is generally used with a scraping stroke, and the other knife is used with a direct cutting stroke. Both of these knives are ground with a rather deep bevel on the upper side, and the underside is left flat. The knife with its cutting edge on an angle has the point squared off to prevent its slitting the leather. It is the quicker of the two in taking down the thickness of leather, but when paring leather very thin, as for inlays, the French knife is perhaps the safer one to use In 106 A and B note the wrapping of leather on the blade of the knives which is to protect the worker's hand when paring.

The most valuable and profound "secret" about paring lies in the sharpness of the paring knife. The stroke itself is simple, but conditioning a knife for paring is by no means simple for a novice Most beginners fail to realize how greatly success in paring depends upon the condition of the knife, and they continue to force a dull knife, hoping to make it cut. A dull knife will not pare leather, and a forced knife may cause much damage When a knife fails to cut, it is simply dull and must be sharpened. The inexperienced parer is inclined to blame his lack of proficiency in making the stroke, when the paring isn't going well, and can hardly be persuaded that nine times out of ten his knife needs sharpening and perhaps even grinding

I have already pointed out in a previous chapter the difference between grinding and sharpening a knife (see p 33). When the bevel of the paring knife is worn down so that it is too thick at the cutting edge to be readily sharpened, it must be reground. The binder can do this work on his own grindstone, or he can send the knife out to get it ground at little expense If he sends it out to be ground, he should paste a paper pattern on the end of it to show the grinder both the angle and the depth to which the bevel is to be ground The French paring knife is usually not ground on an angle, but is merely rounded at the cutting end. A

convenient shape is shown in Fig. 106 A The bevel is about one-half to five-eighths of an inch deep If the edge of the other knife is ground at an angle about half that of a right angle, it will be found that the stroke may be well controlled A more acute angle will allow of more speed in paring, but neither so fine nor sure paring can be done with it. The bevel for this knife should be about three-quarters of an inch deep and should graduate evenly to a thin edge.

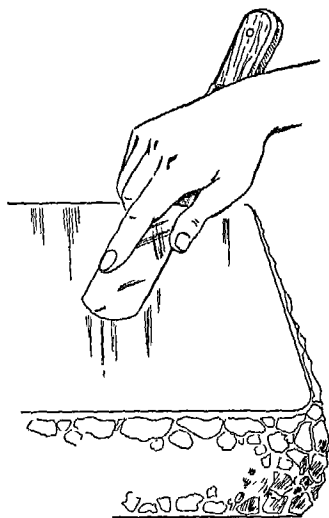



Fig 107 A.

As for sharpening, a considerable amount of intuitive comprehension is called for if the operator is to succeed The ability to sharpen a paring knife is attained only after considerable experience, but there are a few general rules that may be laid down

SHARPENING A FRENCH PARING KNIFE. Sharpening a French paring knife is not an involved process The edge, in order to do its work, must have a slight burr on it, that is, the edge must be turned over from the beveled side to the underside Before the burr is turned over, the knife is drawn back and forth

over a fine oilstone until the edge is thinned. It is stropped to get a smoother and finer edge, and then, with the beveled side down, it is lightly rubbed on the surface of a lithographic stone, or paring block, until the edge is turned over (see Fig 107 A) If too much burr has been turned over, it may be taken off by rubbing the knife on the stone with the flat side down.

SHARPENING AN ANGLE-EDGED PARING KNIFE. An angle-edged paring knife is universally used for paring, especially by job binders, but I am unable to give it a national designation, though it is to be presumed that it originated in England or

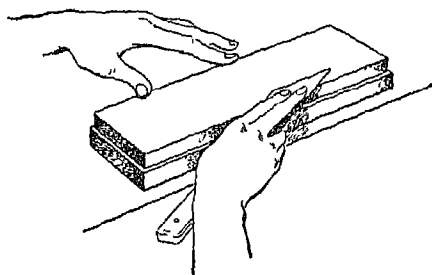



Fig 107 B

Germany. In order to be able to refer to this knife without confusion, I shall hereafter call it the "edging knife," since in this country it is in general use for edging leather. To sharpen the edging knife, the edge must first be examined to see where it needs thinning. Thick spots are indicated by a sort of highlight showing along the beveled edge. To thin the edge of the knife, it is held with the beveled side down, with the handle resting in the palm of the hand, and with the first and second fingers on top of the blade. The blade is placed on the stone, parallel with the length of the stone, and is tilted at a slight angle as it is drawn back and forth (see Fig 107 B). The angle at which it is held depends upon how much sharpening the knife needs. The knife should never be sharpened with a circular motion, for this will leave low and

high spots on the bevel instead of leaving it of even thickness. After the edge has been thinned in this manner with whatever pressure is needed, the knife is tilted at a much greater angle and is very lightly drawn back and forth over the stone, in order to produce a "secondary bevel," suitable for cutting A secondary bevel is an almost infinitesimal bevel made on the cutting edge of the deep bevel ground on the knife Producing and keeping this bevel are tricks that must be learned

After being sharpened on the stone, the knife is well stropped. With bevel down, the whole blade is drawn with considerable pressure over the strop from left to right, with the thumb on top of it. When the right end of the strop is reached, the knife is flopped over in the hand so that the two first fingers are on top of the blade, and it is lightly drawn back on the strop with the beveled side uppermost. Care must be taken to keep the whole blade of the knife on the strop, to prevent its being worn down more at the "toe" than at the "heel." The toe of a knife is at the point of the blade, the heel is at the opposite end of the blade. If the whole blade is not kept on the strop, it will develop such a curved shape that its efficiency will be impaired, and it will have to be reground frequently Always, in stropping, a knife must be kept absolutely flat or the edge will be thickened instead of thinned. The expert parer strops after every few strokes of the knife and thus keeps his cutting blade in perfect condition.

Paring knives are tempered to different degrees of hardness A mediumly hard-tempered knife will be found the most satisfactory for paring If the knife is too soft, the edge will wear down quickly and continual sharpening will be necessary If it is too hard, it is very difficult to sharpen.

SHARPENING STONES Oilstones with different degrees of coarseness are needed for paring One knife may require a finer or a coarser stone in order to be sharpened But these stones

should all be of fairly fine quality, and little oil should be used on them. Too much oil on a stone interferes with the "biting" action of the stone.

MARKING UP LEATHER. Before paring is begun, the leather must be marked up to indicate the margins for turning over the board edges, and lines are drawn to mark the width of the back. To mark up for a full binding, the leather is folded from outside inward, with fore-edges even, so that the center of it may be found. The center is marked at head and tail on the "flesher" side of the leather — the side next the animal. Then the width of the back of the book is measured from board to board with the straight edge of a piece of a paper and this width is marked on the paper. The paper is folded over, mark on mark, to find the center of the back measure, and this is indicated on the paper. Then this back center mark is placed on the center mark of the leather, the width of the back is marked at head and tail from the measure on the paper and lines are drawn through these marks to outline the position of the back. The book is placed on the leather with the back edge of one board on one of these lines, and it is centered on the width of the leather, with the same amount left beyond the board at head and tail. The boundary lines of this board are then drawn, and the lines for the second board are drawn in the same way (Figs. 103, 108). This may seem to be somewhat complicated, but the operation is very simple, and marking up leather in this way is far more quickly accomplished than measuring with the dividers. The dotted lines in Fig. 108 indicate where the leather is to be cut off before paring.

The leather will stretch from back to fore-edge in the process of covering. To allow for this stretching the two fore-edge lines must be re-marked a little back from the edge of the board. Leathers differ in the amount they will stretch, but this can be closely estimated. To determine the amount of stretch likely, one

side of the book is placed on the leather with the back edge of the board on one of the lines marked for the back. The fore-edge of the book is brought slightly over the front of the workbench, and with pressure on the cover of the book at the back edge to hold the book in place, the leather underneath the book is pulled to its extreme length. In this way the amount of probable stretch there is in the leather may be seen and a mark is made on the leather, back of the front edge of the board, to indicate where to draw the

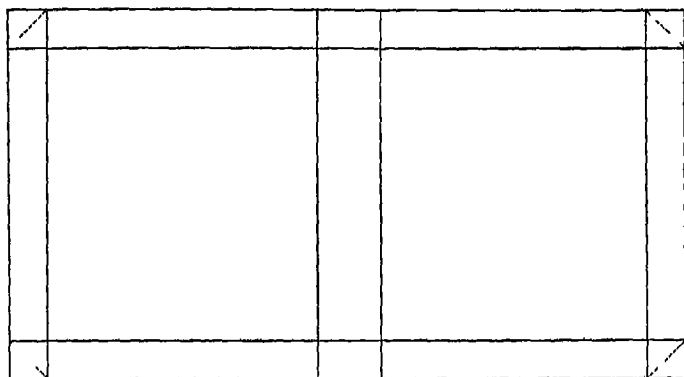



Fig. 108.

final fore-edge line for paring. No allowance is made for stretching from head to tail of the book

The leather for a half binding is marked in the same way as for a whole binding except that no fore-edge marks are necessary.

PARING LEATHER

The technique of paring leather is illusive, and learning to pare is very much like learning to play golf. There is, first of all, a knack that has to be mastered, and then various conditions play their part in contributing to success or failure The worker must learn to recognize these conditions, and either utilize them or overcome them. It is utterly impossible to teach paring verbally.

The best that can be done, when practical demonstration is impossible, is to outline where and why leather must be thinned by paring and make some helpful suggestions about the process. The learner must then proceed by the trial-and-error method to master the technique.

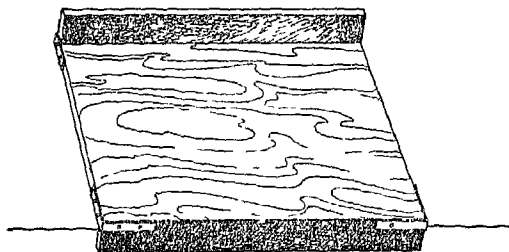



Fig. 109 A

The margins of leather extending beyond the cover boards must be pared, or thinned down, in order that they may be neatly turned over onto the inside of the covers If the leather along the lines marking the width of the back is thick or stiff, it must also be pared or it will wrinkle on the outside of the book

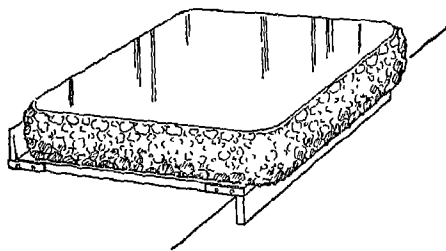



Fig 109 B.

along the joint and will make the opening of the book more difficult There is a tendency to pare margins too thin for the sake of achieving a very finished appearance Margins should not be pared more than enough to allow the leather to be turned over neatly Too thin paring is to be condemned because the pores of

a skin run through it from the upper to the lower surface, and cutting through them deeply impairs the strength of leather and shortens its life materially as a book covering.

The best surface on which to pare leather is a lithographic stone. It may be bought new at a binder's supply place, or used ones, which are quite as good when they are cleaned off, may be had from a lithographic printer Leather can also be pared on a slab of marble or of glass

As some pressure must be used in paring, the stone, even when heavy, is liable to keep pushing back on the bench. In order

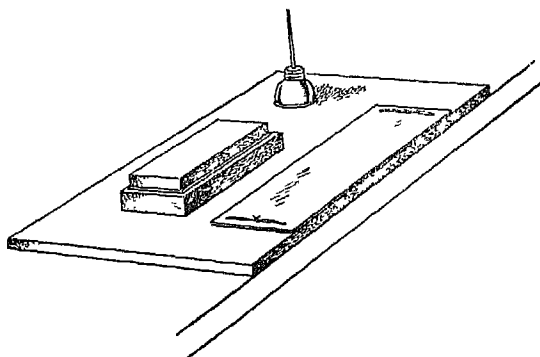



Fig 110

to steady it and keep it in place, a device made of wood serves well (see Figs. 109 A and B) This is made by taking a piece of wood about 9 x 12 x ⅜ inches and securing to it, with small angle irons, two wooden rims about 1⅜ inches wide by ⅜ of an inch thick — one going down to hold the wooden frame to the table and the other going up to hold the lithographic block in place. The angle irons are placed around the four corners of the board.

A leather strop, a sharpening stone, and an oilcan will be needed in paring In order to keep these things together conveniently, the following device will be found useful (see Fig 110)· This is made up of plyboard or other material about ¼ of an inch

thick, 12 inches long, and 8 inches wide. Instead of plyboard, binder's board may be squared to this size and glued together. The top surface is varnished to keep the oil from penetrating and making a messy board. Then a piece of leather belting, 3 inches wide and the length of the board, is sewed firmly onto the board at each end with heavy linen thread. The belting should be even with the front edge of the board To sew it on, holes must be pierced through the leather and board with an awl. The underside of the board is then lined up with split leather to keep it from slipping On the free part of the board back of the strop, the sharpening stone and oilcan are placed for the work of paring, and the whole board is conveniently placed to the right of the paring stone.

PARING FULL LEATHER COVERS Edges may be pared to a line, or they may be pared well back of a line and beveled gradually In paring so that the bevel begins far back of the line marked to indicate the boundaries of the boards, the French paring knife will be found the better one to use. In paring to the board lines, it is advisable to use both paring knives. The edging knife is used for thinning down the edges from the line, and the French knife is used to take down abrupt bevels.

In beginning to pare the margins, the edges are first beveled all round the cover. Either of the two paring knives may be used for this and should be held at quite an angle The leather is placed on the paring stone with the grain side down and is held against the side of the block with the left thumb. The bevel is started at the right end of the edge by drawing the knife sharply to the right to produce a small cut. Then, with the edge of the leather almost parallel to the worker, the knife is placed in this cut and is pressed to the left along the edge, taking off the leather somewhat less than an eighth of an inch, on an abrupt bevel The leather is placed at a slight angle to the front of the paring stone,

and with the thumb still holding it as before, the wrist is turned so that the fingers may point toward the left as they lie on top of the leather, in order to keep the leather held flat as the paring strokes are made (see Fig. 111) If the fingers are not pressing toward the left as the stroke is being made, the leather will bunch up and prevent the parer from finishing the stroke. When any part of the leather is being pared, it should be held on the stone, close to the front. If it is placed any distance back on the stone, the knife cannot be held flat

A paring knife with the beveled side up is held with the handle resting in the palm of the right hand and with the first and sec-

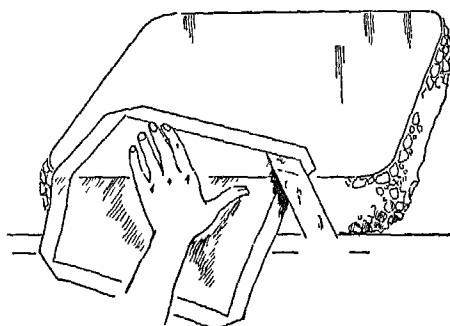



Fig. 111

ond fingers on top of the knife. To pare the margins to a line, the edging knife is used. The blade is placed just back of the marked line and is pressed forward, being directed toward the left at an angle of about twenty-five degrees instead of being pressed straight out at right angles to the line. The beginning of the cut is made with the point of the knife, and as the stroke proceeds, most of the blade comes into use. The knife must be held very flat for this cutting stroke, and as the stroke is made, there must be a constant, steady pressure downward as well as forward The angles for holding the leather and for the stroke of the knife are indicated in Fig. 111. Too much leather must not be cut off with

a single stroke — only as much is cut at a time as can be taken off evenly and without forcing the knife. The edges usually require going over two or three times, a little thickness being taken off at a time, before they are thinned sufficiently. The worker should always be seated when using this knife

After the edge has been gone over with the edging knife, there will be a "shoulder," or ridge, left on the leather where the edge began to be pared at the line. This ridge should be smoothed off with the French paring knife after each time the other knife is used. If this ridge is not leveled, paring down again with the edging knife will be difficult, and there will be danger of cutting in. Whenever the marked lines are cut off in paring, they should be put in again.

The French paring knife is not difficult to learn to use. It may be used with both a cutting and a scraping stroke, but except for edging work, it is mostly used with a scraping stroke. It will be found that this knife is more easily used if the parer is standing. He can do the work more quickly in this position, as the knife may be held at a greater angle with safety, and thus he can put more force into the stroke and take off a greater amount of leather at a time. The knife is held in the same manner as the edging knife, and the stroke is made at the same angle also. When paring with this knife, the handle is tilted slightly upward, and the knife is drawn forward and backward in short, quick strokes. The amount to tilt the knife varies with the leather — the softer the leather, the greater the angle at which it may be used with safety, and consequently the quicker the paring.

As the edges are being pared, they should be tested for thickness and evenness from time to time To test them, the leather is folded over with the grain inside, and the fingers and thumb are run over the fold The thickness, as well as any unevenness, can be judged in this way. This same test should be made along the middle of the margin. The margins are pared so that they gradu-

ate from the thickest part, which is along the line, to a fairly thin edge.

Usually a little paring has to be done along the edges which outline the position of the back. This is done with the French knife unless the leather is very heavy, when both knives may be brought into use With small books, the paring often has to extend over the leather covering the back itself. By folding over the leather with the flesher side out and rolling it between the fingers and thumb, the worker can readily judge whether or not it is too thick to work over the bands of the book. The leather over the joint should not be pared more than enough to allow a free opening of the book.

After the back and margins are pared evenly, the two leather margins within the marks for the back must be pared still further. The part of the leather which turns over to form the headcap should be thinned only slightly — just enough so that after the headcap has been formed it will be on a line with the boards. But the remaining part of the leather, beyond that used to make the headcap, is graduated down until at the edge it is quite thin. This is to prevent this doubled-over leather from making a ridge on the back.

Paring Half Leather Covers. The leather for half bindings, which reaches over the back and end margins, is pared the same as for whole bindings. Where the leather ends on the sides, it is beveled off and thinned down to a thickness equal to the "filling-in" boards, which are glued up to it (see p 247).

To pare the corners, the measuring corner pattern (see Fig. 104) is placed on the leather corner with its long, or diagonal, side even with the long side of the leather. The outline of the corner pattern is marked on the leather with a pencil to indicate the margins to be turned over the board, and these are pared like the margins of a full leather binding. The leather projecting be-

yond the point of the corner outline is cut off so that it is just long enough to be folded over the corner and to overlap slightly on the inside of the cover. This small space of leather at the tip of the triangle is thinned down somewhat more than the other margins to enable it to be folded over the board neatly.

PARING LEATHER HINGES. Leather hinges are cut to a width that allows the leather to go over the joint of the book and be pasted on an end paper, plus the width of the turn-ins, or margins, of the cover. The length of the hinges is cut about a half inch longer than the bookboard, to allow for a possible accident in paring When the measure of the depth of the joint has been taken, a liberal one-quarter inch should be added to it, and this distance is marked on the long side of the leather hinge after the length has been cut The remaining width represents the part of the leather that is to lie on the inside of the book cover.

The margin of the hinge which is to rest on the inside of the book cover is pared the same thickness as the other inside margins. That part of the hinge which is to be pasted over the joint and onto the end paper is pared quite thin, increasingly thin toward the edge.

It has already been indicated (see Fig. 46 C) that leather hinges are attached to the end paper when they are to be sewed with it, and they must therefore be pared before the book is sewed. The procedure for attaching leather hinges to be put in after the book has been covered will be explained in proper sequence.

PARING INLAYS, LEATHER FLYLEAVES, AND DOUBLURES Leather for inlaying or onlaying a design must be pared very thin. The edges are pared to paper thinness, though the center may be left somewhat thicker if the inlay is large, in order to allow the inlaid pattern to stand out This is purely a matter of judgment and taste, dependent upon the type of inlay If control of the edging paring knife has been mastered, this knife is best

used for small inlays An inlay must be pared absolutely even, or bumps will appear on its surface.

Leather flyleaves and doublures are the most difficult to pare. They too must be pared to an even thickness The leather, if thick, should be sent out to be thinned down, unless a leather-paring machine is in the binder's equipment. When received from the professional parer, the flyleaves must be still further pared down to the thinness desired They must be of the same thickness throughout The doublures may be slightly thicker in the center, but the edges must be of a thickness equal to the thickness of the leather margins Either the French knife or the edging knife may be used for the paring Very likely both should be employed to attain the greatest efficiency.

PARING PAPER

Paper paring is quite tricky. It is done with a very sharp knife on which a slight burr has been put To get a burr on a knife for paring paper, the cutting edge is drawn several times across a lithographic stone, with the blade tilted to just less than ninety degrees and with the bevel down toward the stone. This should turn the edge over to form the burr that is needed The edge to be pared should be placed away from the worker and almost parallel to him. Then with the burr downward and the knife held at a slight angle, the edge of the paper can be pared off from right to left in a long curl, with slight pressure of the knife. The amount of burr needed, as well as the amount of pressure to be used and the angle at which the knife is to be held, will vary with different papers, and it requires considerable practice to learn to pare paper with an evenly beveled edge The greater the angle of the knife, the shorter and sharper the bevel will be.

CHAPTER XV

FORWARDING

Covering Cutting Inside Margins and Filling In. Pasting Back End Papers

COVERING

BEFORE a book is covered, the boards must be cleaned up If there are any spots of glue or paste on them, they should be removed, and the edges should be rubbed down with a folder to take off any burr. If the slips on the outside are too thick, they are trimmed down so that they will not show too prominently. Then a piece of wrapping paper, cut a little larger than the boards, is glued and is lined down on the outside of each board. It is placed with one straight edge just barely up to the edge of the board next the joint and is rubbed down A tin is put under the board, and with a knife, the paper is cut even with the board edges. Wrapping paper is likewise lined down on the inside of the boards to counteract any warping After the boards are lined, the book is put aside under a weight until the paper has dried After it has dried, it is sandpapered down just over the slips on both the inside and the outside of the boards until the bumps produced by the slips have disappeared These lining papers prevent the slips from showing through.

The squares of the book should be looked to, for although they were "set" when the boards were laced on, they may have been disturbed. To reset them, some paste is put on the underside of each slip, after the boards are adjusted so that the squares are even all round, the slips are tapped with a hammer on the outside of the board, as when lacing in; and the book is put in the press with covered tins outside and inside of the boards and is left for about fifteen minutes

If the cords have not been straightened and made equidistant,

this should be done before covering, and they should be nipped up tightly with a pair of nickel-plated band nippers (see Fig. 112). Presumably the cover was marked after paring; if not, the

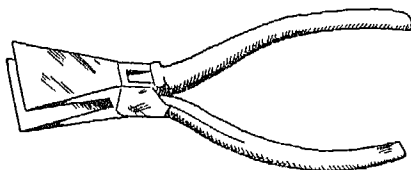



Fig. 112

marking should be done before beginning to cover. The lines should be distinct and should run all the way to the edges of the leather, as this makes the placement of the book on the leather easier and quicker.

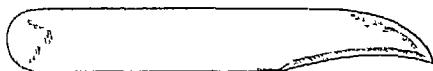



Fig 113

Before the covering, there must be ready on the workbench: a bowl of well-beaten-up starch paste; a clean paste brush, a jar of commercial paste; two shaped covering folders, one for pulling over the leather and smoothing it down (Fig. 30) and the other

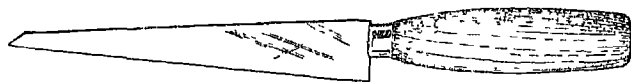



Fig 114

for use in shaping the headcaps (see Fig. 113), a small bowl of water with a sponge; a utility knife, a corner knife (see Fig. 114); a pair of shears, a band stick (a piece of wood about eight inches long by half an inch thick and three-quarters of an inch wide covered with split skin), a pair of band nippers, a headcap-

setting block (see Fig. 115); a utility sharpening stone; a clean lithographic block; several pieces of unprinted news; several thicknesses of paper towels; two celluloid sheets; a piece of strong sewing thread, and a cloth for wiping off the hands or the lithographic block. After these things are assembled, the binder is ready for covering.

The novice has a tendency to feel hurried and flustered when covering, but if the leather is pasted properly and the whole operation of covering has been analyzed and resolved into successive steps, there is no need of hurrying. I have found that if the begin-

Fig 115

ner has these steps outlined before him as he works, he gains confidence and poise An outline serves to dispel his nervousness from the fear of forgetting to do something at the proper time. After covering has been done a few times in this way, the progressive order of working becomes automatic. Following is an outline suggested for this purpose:

1. Paste leather and fold over.
2. Nick corners of boards
3. Paste spine with commercial paste.
4. Repaste leather.
5. Place book on leather and pull up left side
6. Dampen leather on spine—pull it over back.
7. Nip up bands slightly.
8. Use band stick until leather begins to stick
9. Nip up.
10. Set sides and rub them down.

11 Nip up.
12. Band-stick again.
13. Tailor back.
14. Cut corners of leather.
15. Nip up and rub down sides with special attention to joint.
16. Paste turn-ins at head or tail
17. Turn over pasted turn-ins
18. Paste opposite turn-ins.
19. Turn over opposite turn-ins
20. Paste fore-edge turn-ins one at a time and turn over.
21 Set and shape headcaps.
22. Give a general tailoring of leather.
23. Set boards to joints
24 Nip up and rub down.
25 Tie thread around book and through nicks at headcaps
26 Set headcaps and shape.
27 Nip up and rub down.

We shall now proceed with instructions based on this synopsis of covering The first thing to be done is to paste the leather cover. The cover is placed on newspaper cut amply large so that the worker is not hampered by fearing to go beyond the edges of it and the leather is pasted from center to fore-edge in order that any stretching will take place on the book-width and not on the book-height of the leather The brush is held as for other pasting If the leather is delicate in color, unprinted news should be used to paste on, but for dark leathers printed newspaper is suitable. There should be a generous amount of paste used in this first pasting of the leather, as the pores of the skin are thirsty for it, and this thirst must be satisfied, otherwise the pores will steal the paste put on later to make the leather adhere to the book In other words, this first coat of paste acts as a filler, or size, and nothing more. It must be evenly applied, and no surplus paste should be

left. The entire success in making a leather adhere firmly to a book, providing it is properly rubbed into place, lies in filling up these pores before paste is applied for the purpose of affixing the leather to the book When pasted smoothly the leather is folded over "to mellow," with the pasted side in.

It may be noted here that a smooth leather, such as calf or sealskin, should be pasted with thinner paste than that used for morocco, levant, or pigskin. The reason is that calf and sealskin

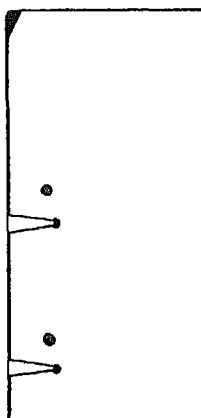



Fig 116.

have many small pores, and a heavy paste would clog them and not penetrate so far as a thinner paste.

While the pasted leather is left folded so that the paste will penetrate the pores of the skin, the four corners of the boards next to the joint are nicked That is, they are cut off at an angle from the upper side, so that the ends of the headbands may have a place to lodge and will not protrude on the sides of the book after it is covered. A tin or headcap setting block is placed under the board at the joint, and the board is cut with the utility knife on an angle slanting toward the joint (see Fig. 116). After this, the spine of the book is pasted thoroughly with a commercial paste in

order to size it, and care must be taken not to leave an excess of paste next the cords.

The leather is then unfolded and is given a second pasting The more perfect side is chosen for the front of the book, and the leather is laid out flat. With the covers of the book held closed, the back of the book is placed down on the leather between the two lines marked for it and between the head and tail margin lines (see Fig. 117) The left side of the leather is brought up on the cover board, the book is turned over on the bench with the fore-edge down, and the other side of the leather is let to fall over its board. The leather on the sides should not yet be put in place, but

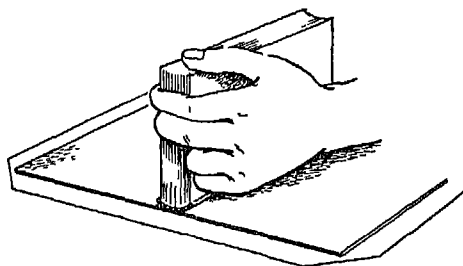



Fig 117

should be allowed to take its approximate position without being pressed down until the leather on the back has been worked over and fixed in place

With the book in this same position, the leather along the back is slightly dampened with a small sponge (except when calf or delicate leathers are used). Then, beginning with the center cord, or, as it will be called hereafter, "band," the worker pulls the leather downward from the end of the book toward the bands, using the palms of the hands on each side of the back. The book is reversed, and the leather is pulled toward the bands from its opposite end. This pulling toward the bands from opposite directions is to ensure a sufficient amount of leather over the bands. Then the leather is pulled straight down on each side of the back

with a good deal of force. The bands are now nipped up with the band nippers (see Fig. 118) just enough to see if sufficient leather has been pulled over them so that they may be later nipped up tightly without having the leather pull away from them. Too much time must not be spent on them just yet, for they will lend themselves to being more firmly nipped up after the paste has taken hold, whereas it is important at this point to work the leather down between the bands and to get the rest of the cover put in its proper place before the paste has had time to dry.

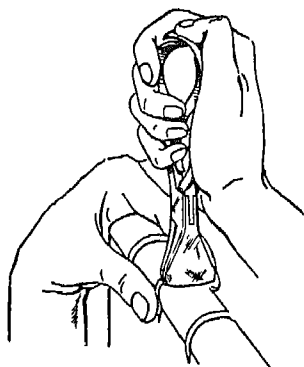



Fig. 118

After the leather on the back of the book has been pulled over tightly, the band stick is used between the bands to induce the leather to stick. With the book parallel to the worker, the stick is pressed, not rubbed, on the leather with a rocking motion. Then when the paste appears to be taking hold on the back, the bands are nipped up again, as they are after almost every operation of covering, and the sides are looked to and set. To set the sides, the book is placed flat on the lithographic stone with the back toward the worker, and the leather is pressed with a folder very firmly over the joint from the back of the book toward the side. This fixes the leather at the joint and brings over any surplus leather. Now the fore-edge of the book is turned toward the

worker, and the leather is raised on a side of the book and pulled over from the joint until the lines marked on it coincide with the edges of the board. If it is necessary to pull the leather in to conform to the marks, it will of course be wrinkled, and then the grain must be "made." To "make" the grain, that is, to form it in a natural pattern, the leather is slightly dampened, and with the ends of the fingers it is worked over with a rotary pushing motion. The grain is arranged in this way to correspond with that on the rest of the leather This process is repeated on the other side of the book. After the leather on the sides has been placed and the grain has been adjusted, paper is put over the sides, and they are rubbed down thoroughly, with particular attention to the board edges and the joints.

All this manipulation of the book has a tendency to interfere with the sticking of the leather on the back, and therefore the back is looked to again. It is nipped up, band-sticked, and "tailored," or finished to a nicety. Almost any amount of time may now be spent on the refinements of the covering, for the leather has been put in place, and it should be sticking firmly. At this point it is well to test the leather over the back to see whether it is adhering. To test the sticking of the leather, the back is placed upward and one board at a time is lifted. If the leather is not stuck down tightly to the back, it will pull away from the board when the board is opened in this way. In that event, the leather over the back must be slightly dampened and then worked over until it is made to stick

The next step is to turn over the margins and miter the corners on the inside. There are several ways of mitering the corners of the leather on the inside of a book, and one of the strongest corners, which will now be described, is mitered before the margins are turned over. For this purpose a corner knife is used (see Fig 114). The knife has a long flexible blade, which is beveled on one side and tapers from the handle toward the end. It

must be kept sharpened to an acute cutting edge The book is placed near the right corner of the covering stone with its covers closed and with its fore-edge to the right. The left hand is put between the book and the bottom board, and the back edge of the knife is drawn at right angles to the corner of the board and a little more than one-eighth of an inch from the corner, to make a line on which the leather is to be cut The leather is then cut on this line by inserting the long-bladed knife under the board at the corner and drawing it sharply across the corner (see Fig. 119). On the inside of the board, a line bisecting the corner is drawn

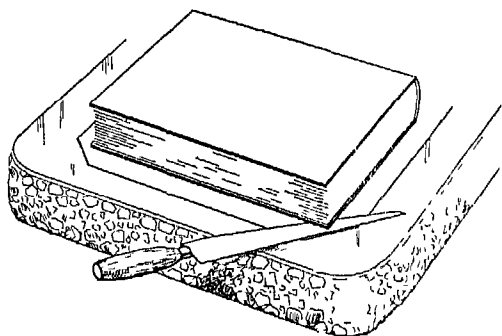



Fig 119

with a pencil, and the leather is brought over onto the inside and tested for length. It should be long enough so that the two sides just lap over each other on the line bisecting the corner. If too long, it should be trimmed in the same manner it was cut It is then thinned down all along the edge back to where it is to turn over onto the board so that the corner can be neatly mitered The cut edge on the fore-edge margin will be turned over the other edge, and it must therefore be thinned carefully and be cleanly cut. The leather on all four corners is cut and mitered in this way, and the coverer is then ready for turning over the margins. If the book to be covered has a hollow back, the paper forming the hollow should be slit up along the joint for about three-quarters of

an inch at head and tail on both sides of the book, so that the leather turn-in, as it comes over the back of the book, may be tucked under the hollow when the turn-in is being turned over.

Beginning with either the head or the tail margin, the leather is pasted thoroughly with starch paste on the inside of the turn-over, and a little paste is put with the finger on the outside of the leather which is to be turned in over the back. Several thicknesses of soft paper toweling are put along the edge of the lithographic stone to prevent the back of the book from being marked. The book is placed back down on the stone and over the edge, and the boards are let to fall open on the stone (see Fig. 120). Then,

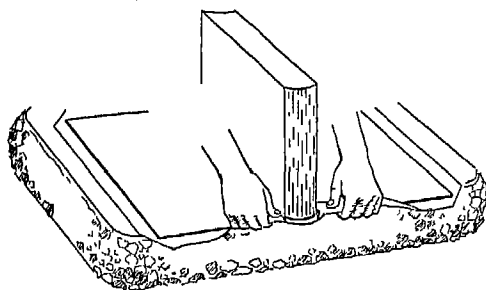



Fig 120.

with one thumb on each of the boards just next to the back of the book and with the index fingers under the turn-ins, the boards are pressed down quickly, and the turn-ins are simultaneously brought over the boards at this point and are tucked in next to the back of the book The left board is then brought up into place to prevent the leather from being pulled away at the joint, and on the underboard, which is on the block, the turn-in leather is pulled over with the covering folder and is smoothed out (see Fig 121 A) At the corner, the leather turned over is made to come just over the bisecting mark on the inside of the board, and the leather on the edge of the book at the corner is folded over onto the edge of the board at the fore-edge (see Fig 121 B) and

is creased firmly so that when the fore-edge turn-in is brought over the edge of the board, the corner will be neatly covered (see Fig 121 C. The projection beyond the corner should not be over

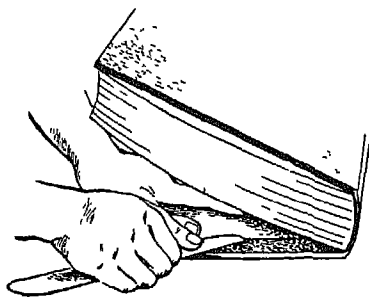



Fig 121 A.

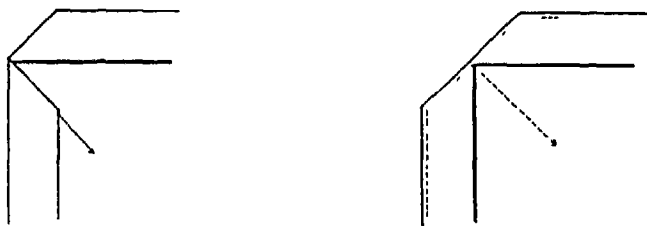



Fig 121 B

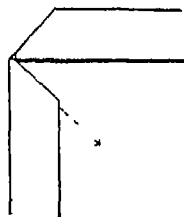



Fig 121 C.

a sixteenth of an inch. If too long, there will be an unsightly pleat at the corner. The leather all along the edge should be squared up on the board. Then the book is turned over and the opposite turn-in is brought over and smoothed down.

The boards of the book are closed, and the headcaps are looked to The leather forming the headcaps should just cover the headband After a little practice, the coverer will be able to leave out just the right amount, but if too little has been left out, the book is placed back down on the stone and the leather is pulled out from the back with the point of a folder until the right amount protrudes evenly. If too much has been left out, the excess leather can usually be worked down on the back of the book toward the band. This is better than trying to get rid of the leather by pushing it in under the back, for the lining paper is liable to be disturbed through this manipulation, and a bump under the leather on the back of the book will result. After the amount of leather left for the headcap has been adjusted it is turned over and patted down with the folder, then the margins on the opposite end of the book are pasted and turned in, and the second headcap is formed Finally the two fore-edge margins are pasted and turned over, and the leather on all the edges of the book is squared up with the folder and made sharp and trim-looking.

The book is now covered, and it is best to give the leather a general tailoring at this point The bands are nipped up, the back and sides rubbed down, and the board edges sharpened Then the boards of the book are squared with the joint. Just here it may be well to remind the reader that there is a technical difference between "a hinge" and "a joint" A joint is that part of the bound book which has been turned over during the backing operation for the board to rest in. A hinge is any material that is fastened over the joint to connect the book with the board. A close analogy will be found in the jamb and hinge of a door; the jamb represents the space provided for hinging the door to the frame, as the joint of a book represents the space for hinging the cover to the book. It is important to make this distinction clear, and this analogy is suggested in order to bring out the necessity of having a joint square if it is to function properly, for we are all acquainted

with doors that swing open when they are unlatched and will not stay closed, because the doorjambs are not square.

If a board has dragged away from the joint (see Fig. 122 A), one cover is opened at right angles to the back of the book, and with a folder in the right hand held up in the joint, the board is forced toward the book and against the folder until it lines with the edge of the joint (see Figs. 122 B and 122 C). Then the cover

Fig 122 A

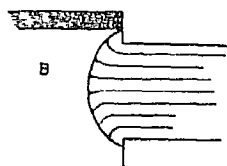



Fig 122 B

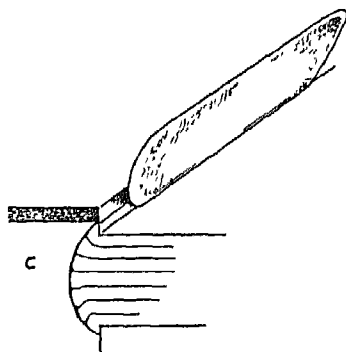



Fig. 122 C

is carefully closed without disturbing the position of the board, and the other joint is set likewise.

After this is done, the bands are again nipped up, the sides and back are rubbed down, and a thread is tied around the book at the back, passing through the nicks on the back edges of the boards. To tie the book up easily it is placed on the stone with the back toward the worker. A piece of linen sewing thread is wound around the index finger of the left hand to hold it firmly and is

then brought twice around the book through the nicks The book is stood up on end, and the thread is pulled firmly, tied in the center of the edge, and then cut off If tied too near the boards, the ends are liable to mark the leather on the back.

The two headcaps are then shaped and set The thread running through the nicks defines the ends of the headcaps and enables the worker to curl the ends over with the headcap folder (see Fig. 113) and give them a trig shape (see Fig. 123). The book is placed down on the headcap setting block (see Fig 115), and a folder is dipped in water and made to smooth the leather

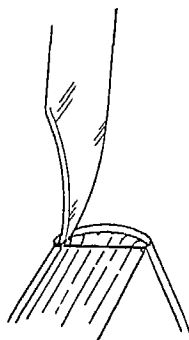



Fig 123

down lightly on the back toward the block. Then the leather is sharply tapped at right angles to the back as the book is pressed down on the setting block. This is done at both head and tail of the book. Since the block is wedge-shaped, the greatest pressure on the book comes on the headcap at the thicker end of the block, so that a sharp outline of the headcap may be made. Again, the meticulous binder nips up, rubs down, and tailors his book carefully. Before the book is put away to dry, the leather cover should be wiped off with a dampened sponge to remove any paste stains. Care must be taken during the covering operation to keep the book from hitting metal tools, for if metal touches damp leather, it will leave a dark stain.

When the book is ready to be put aside to dry, celluloid sheets are slipped between the book and the cover board on each side without raising the boards and disturbing the joints. The book is put away between several thicknesses of printed newspaper with a sheet of unprinted news next the leather, and a lithographic block is placed over it. It is left for about three-quarters of an hour, or until the paste has had time to take hold. At the end of this time the book is taken from under the weight, the thread is cut, and the joints are looked to. This is merely a matter of insurance, for the boards are probably set in place, but, should they

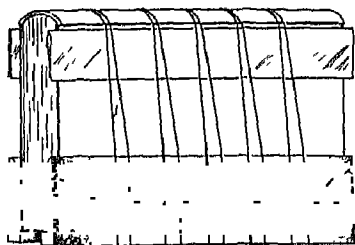



Fig 124.

need forcing up a bit toward the joint, this can now be done effectually before the paste has thoroughly dried. After the setting of joints has been done, the covers of the book are closed, and the headcaps, which have been disturbed by opening of the book, are set and tailored again. The book is then put under the stone, after being placed between fresh papers, and is left to dry overnight. It is very necessary to change the papers, for the first papers absorb a great deal of dampness from the leather cover and are likely to be marked in wavy lines, which would be imprinted on the leather cover if the paper were left on the book.

Should there be trouble in making the leather stick on the back, as is not unlikely to happen in the case of very thin books, it is best to tie the book up after it is covered, instead of putting it

under a lithographic stone A pair of tying-up boards, which have a small ledge on the bottom to hold the book, are used (see Fig. 124) Before the book is tied up, celluloid sheets are put in between the text and the bookboards After the book is placed between the tying-up boards, the heaviest sewing thread or fine string is first wrapped around the length of the boards two or three times and fastened with a knot, and then it is brought up from underneath the boards over the underside of the first right band, is run around the book, and is brought up on the opposite side of the same band. This is continued around all the bands, as shown in Fig. 124. The thread must be laid close up to the bands, is pulled as tightly as possible, and is finally fastened by drawing it through a slit in the end of the tying-up board. A strip of paper folded over several times is drawn up under the threads near the back on each side of the book to prevent the book from being marked. After the book has been left tied up for about three-quarters of an hour, it may be untied, and if the back is sticking, the book is put away under a stone as previously described.

The day after a book has been covered, its boards should be opened, but if the leather binds over the joints, the opening must not be proceeded with until the leather has been loosened. The book is placed on the bench with one cover pulled back as far as it will go without straining the leather, and a supporting board of the same thickness as the book is put under it The leather near the joint is then dampened with a sable brush, and the water is spread over the whole margin, so that a watermark rim will not be left on the leather As soon as the leather is sufficiently dampened, it may be lifted from the board near the joint with the point of a small bone folder. This stretches the leather somewhat, and the board is then pushed toward the back of the book until it is squared to the joint After the board is squared up at both ends, a little paste is put under the freed leather, and with a piece of paper over it, the leather is rubbed down in place. The board is

left in this position without disturbing the joint, and the book is turned over If the second board opens stiffly, the leather is freed at the joint and is set as for the first one. The book must be left in this position, with both boards turned back at right angles to the book and with a board between them, until the freshly pasted leather is dry. This usually takes about a half hour. The boards are then closed, and the book is put away under a heavy weight until needed. It may be well to point out that if the leather had not been pulled away unduly from the joint when it was being turned over the boards, it would not be necessary to loosen it after covering

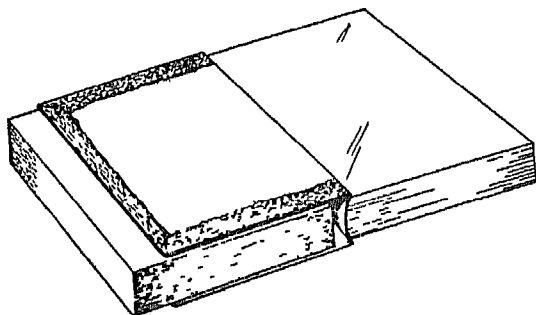



Fig. 125.

CUTTING INSIDE MARGINS AND FILLING IN

After a book has been covered, the leather margins on the inside of the cover are uneven and must be trimmed. To prevent a depression from showing under the end papers after they are pasted back, the cover is lined with a piece of board equal in thickness to the leather turn-ins. The book is placed on the bench with both of the covers turned back, and a board is put between them to keep them level so that they will not be pulled away from the joint (see Fig. 125) If the book has leather hinges, this process is deferred until after the leather hinges have been pasted down.

A very satisfactory kind of board to use for filling in is newsboard or chipboard. A thickness is chosen equal to the thickness of the leather margins, and a piece is cut for each side of the book a trifle smaller than the bookboard, with one straight edge along its length. A width is decided on for the margin and the dividers are set to this measure. The straight edge of the filling-in board is set just a hairbreadth back of the cover board at the joint, and the underside of the filling-in board is marked at the joint to correspond with a mark put on the cover board opposite it. A weight is then put on the board to keep it from slipping, and the width decided on for the margin is marked on the filling-in board with the dividers. At each of the two corners of the board, intersecting lines are drawn with the dividers to define the corner accurately, and the point of the cutting knife is punched into each of the lines where they cross at the corner, marking it deeply to make a stopping place that prevents cutting beyond the corner. With a straightedge placed on the marks indicated for the width of the margins, the leather and filling-in paper are cut with a sharp utility knife. During the cutting process, the book should be turned so that the line to be cut will be perpendicular to the worker. When the cutting is finished, the leather cut off beyond the width of the margins is removed from the board, and even margins of leather will be left on three sides of the board The filling-in board, which was cut with the leather, is bound to fit exactly into the center space

The filling-in board must now be pasted in place. A very small shaving is cut off the length of the board, as it will stretch after being pasted. The board is then pasted from length to length and is put in place, with attention given to the marks which identify its position, and it is rubbed down thoroughly. If it has stretched beyond the leather margins it must be cut off, in order that it may sink down level with the leather. When the pasting is finished, the book is stood up to dry, with its boards held open by a piece

of cardboard cut out to fit over the board edges (see Fig 126). When dry, it is put away lying on one side with a weight over it, and it should be kept always weighted when it is not being worked on.

PASTING BACK END PAPERS

Most binders prefer to leave the pasting back of end papers until after the book is titled and decorated, but since this is essentially a job for the forwarder, it will be described at this point, as it may be done any time after the boards have been filled in.

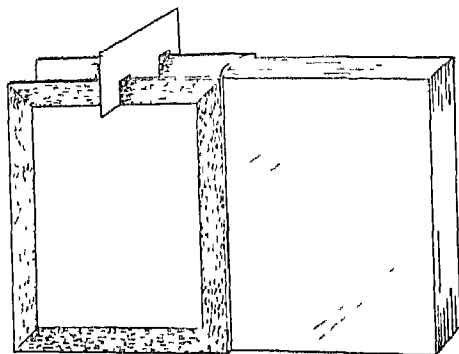



Fig 126.

Before the end papers are pasted back, they are cut so that they come just over the leather on the inside margins The book is placed on the bench with both covers turned back, and enough boards are built up between the covers so that they will not pull away at the joint. The protection sheet is pulled off, and with a knife, the joint is cleared of any particles of glue or other foreign substance. The dividers are then set to a distance a little narrower than the leather margins, and the outside end paper is drawn over onto the board, is rubbed down all along the joint, and is firmly creased With the paper drawn tightly over the board, two points are made on the end paper by the set dividers on all three sides of the cover. The measure is taken with one point of the

dividers resting on the edge of the cover A cutting tin is placed on the book, and the end paper is let down over it and is trimmed off with a knife and straightedge, through the divider points at head and tail. Little tabs are left to cover the joint at each end of the paper. These should be cut in width to the depth of the joint (see Fig 127) Instead of cutting through the points on the fore-edge, the cut is made just inside of the points so that the end paper will be a trifle shorter on this edge. The reason for cutting this edge of the paper short of the points is that, after being pasted, the paper will stretch in this direction The book should be turned so that the line to be cut is perpendicular to and on the

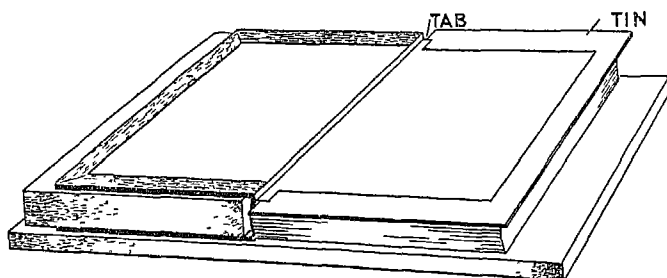



Fig 127

right side of the worker, while cutting. At this point it must not be forgotten that in order to produce a clean edge, heavy pressure must be put on the straightedge with the left hand and the very slightest pressure must be used with the knife. After both end papers are cut, they are ready to be pasted back.

To paste back the end papers of a book, the two boards are turned back as for filling in (see Fig. 125), and a piece of waste-paper is laid under the cut end paper which is to be pasted. Some commercial paste is beaten up to a smooth consistency and is thinned down only just enough so that, when being applied, the brush will not drag and stretch the end paper more than neces-

sary. A little thick paste is first well rubbed into the joint of the book with a finger, and then the thinned-down paste is applied to the surface of the end paper. When applying the paste the worker takes a very small amount of paste into his brush and directs a few strokes of the brush along the length of the end paper at the joint of the book He then applies the paste over the rest of the end paper with all strokes of the brush directed from the joint toward the fore-edge, in order that the paper will stretch evenly in this direction and not stretch in "pockets," as it would if the brush strokes were not all directed the same way

After being pasted, the end paper is taken up with the left thumb and fingers at the center of the fore-edge, is brought over onto the cover, and is held firmly a little up from the cover board. It is then smoothed over the joint tautly with the right hand, and is let to fall in place on the cover. Without delay a piece of wastepaper is placed over the joint and the end paper is rubbed firmly along the joint with the forefinger and thumb. A piece of wastepaper is then placed over the end paper, which lies on the cover board and it is rubbed with a folder until it lies smoothly in place. After this is done the worker should again rub down over the joint with his forefinger and thumb. Frequently a joint requires a considerable amount of rubbing in order to make the paper adhere firmly, and a piece of wastepaper should cover the end paper over the joint while the rubbing is being done. After one end paper is pasted down the book is turned over with care not to disturb the joint, and the other paper is pasted down.

If the end paper has stretched so that the leather margins are not equal in width, the end paper should be compassed off with the dividers and cut so that the margins are made uniform. When removing the cutoff pieces of paper a little water should be applied to them with a small camel's-hair brush, and after the water has penetrated the cut strips they may be pulled off without injury to the surface of the leather.

After the end papers have been pasted down, a pressing board is removed from between the bookboards and is laid on a table. The book is placed on the board with the book boards left bent back and with the joint projecting a little beyond the pressing board so that the air may get to the joint as the end paper dries A wad of paper of a size sufficient to support the upper bookboard and keep it level is put between the open boards (see Fig. 128) The book is turned over about every ten minutes for about a half

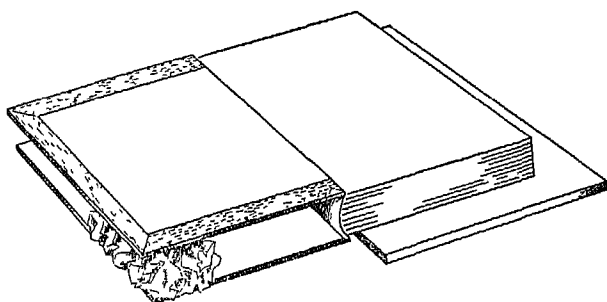



Fig 128

hour in order that the end papers may dry evenly. When dry, the boards are closed and covered tins are put inside and outside the boards just up to the joint. The book is put in the standing press with the back edges of the bookboards even with the edges of the pressing boards. The press is wrung down lightly so that the mere weight of the platen is on the book. Too much pressure put on a book after it has been covered will cause the leather over the backbone to wrinkle and be loosened.

Knowing just when to close a book after the end papers have been pasted down requires some judgment If the book is closed too soon, the end papers will wrinkle over the joint. If the hinge is let to get too dry before closing the book covers, it will cause a swelling over the joint on the outside of the book. Should there be any doubt about closing a book at the end of a half hour, one

board of the book may be slightly pulled back, and if a swelling begins to show along the joint on the outside, the book is ready to be closed. A small amount of swelling will be smoothed out in pressing

End papers are usually pasted back after the book has been tooled and polished.

CHAPTER XVI

FORWARDING

Leather Hinges Doublures. Flyleaves

LEATHER HINGES

SEWED WITH THE BOOK. All leather hinges are put in place before the margins are cut and the filling in is done. Leather hinges sewed with the book are already attached to it and have only to be cut before being pasted down. The protective casing and the protection sheets are removed from the book, and the joint is cleaned out and freed from any glue or pieces of paper. The book is placed with its covers as for filling in (see Fig. 125) and the two corners of the board next to the joint are bisected and

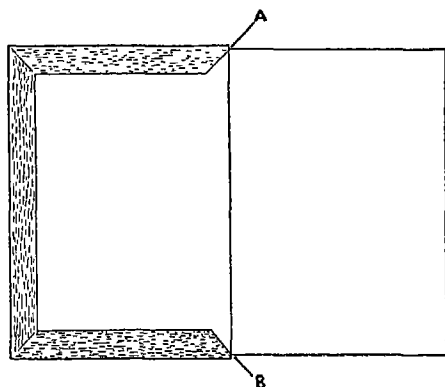



Fig 129

are marked by a line with the point of a folder. The division line should not come from the point of the corner, but should start somewhat down from it along the joint, at a point even with the edges of the book (see Fig 129). Otherwise, the leather would be mitered so that it would have to be cut away at the extreme end of the board and thus weakened where strength is essential. After being marked, the leather on the board is beveled off along

the division line at the corners with a sharp paring knife, the beveling starting just beyond the line. The pieces of leather cut off are removed from the board with a knife, and the leather hinge is then mitered and beveled at each end to fit over the mitered edges of the leather on the board.

After the hinges have been mitered, they are pasted down in place. The hinge is laid back over the book, and with a piece of wastepaper under it, is thoroughly pasted with a fairly thick, smooth paste. Then a little full-strength commercial paste is rubbed into the joint. The joint must be thoroughly coated, though no excess paste should be left in it. The hinge is then repasted and put in place, with care to set the mitered corners neatly. It is rubbed down over the joint with the forefinger and thumb, is smoothed out and is rubbed down over the bookboard. This rubbing is always done with paper over the hinge. The whole operation of pasting down a leather hinge is exactly like that of pasting back an end paper, except that the leather hinge must be allowed to dry somewhat longer than an end paper. Detailed directions for proceeding with the rubbing down, placing aside to dry, and putting in the press will be found on p. 226.

Pasted In After Covering. Hinges which are put in after the book is covered are mitered like the sewed-in hinges. Before being mitered, they are cut off. The hinge will stretch after being pasted and must therefore be cut shorter than the distance between the two longest points of the bevels already cut on the margins, that is, between A and B, as shown in Fig. 129. The longer the hinge, of course, the greater the stretch will be, and the most accurate way of determining the length to cut the hinge is to put it in place and observe how much it stretches when pulled firmly from one mitered corner to the other. For an octavo volume with leather of average stretching quality, it will be somewhat more than one-eighth of an inch. After being cut, the

hinge is mitered and beveled to complement the bevel already made on the margin The beveled edges on the hinge should be cut to lap just over the other edges The second hinge is cut in the same manner. For directions for paring leather hinges, see p. 204

After being pared, they should have been marked on the underside with a line indicating the part that is to go over the joint, as this portion of the hinge has been pared considerably thinner than that which rests on the board (see p 204). When the hinges are ready to be put into the book, one of them is pasted with starch paste and is folded over and left while some commercial paste is rubbed into the joint The hinge is repasted and is put in place with the marked line exactly on the back edge of the board The leather is worked down sharply over the joint, and the surplus width is smoothed out over the end paper. The joint is rubbed, and then the leather on the cover board is put in place, first at one corner and then at the other. It is smoothed down and rubbed until it adheres firmly. The joint is then rubbed down again, and the work is finished as just described for sewed-in hinges.

When the hinge is sewed with the book, it will not be necessary to add any extra thickness of paper at the joint to allow for the thickness of the hinge, as the leather hinge was made a part of the end paper and was backed with the book But when the hinge is to be put in after the book has been covered, allowance for the added thickness of leather should be made, and an extra piece of paper is folded around the end papers before sewing and is removed just before pasting in the hinge.

DOUBLURES

Books with leather or silk doublures are filled in with paper instead of newsboard in order that the doublure will be sunk into the leather frame of the margins After the hinges have dried,

the margins are measured off, and if leather doublures are to be used, the margin leather is cut on a short, even bevel which slants toward the center of the board The filling-in paper is then cut to fit the framework it is intended to fill, and a piece is cut off its length, the amount depending on how much the boards should be warped.

Most cover boards need to be made to curl inward, as heat and atmospheric changes have a tendency to make them curl away from the book When end papers are pasted down they serve this warping purpose, but doublures that are merely "tipped in" have no warping value, and for this reason it is always necessary to line down under them a warping paper that will curve the board perceptibly. Leather doublures, on the other hand, are pasted in overall, and they therefore warp a board to some extent, though since they cover only the central part of the board, their warping value is not as great as that of an end paper, and a little extra warping is called for before these doublures are put in place

The thinner the paper the greater its warping quality, providing it is of firm texture. For example, a thin linen-bond paper will warp a board to a greater degree than a thicker bond paper of like quality or than a piece of sturdy wrapping paper. This is understandable, for it is easier to stretch a thin material than a thicker one of the same texture. Bearing this in mind, the binder should select a warping paper with due consideration to the amount of warp needed on the board

Paper suitable for the purpose having been chosen, it should be cut as wide as the leather framework between the margins and as much shorter than the length of the framework as is necessary to effect the required warping of the board when stretched It is dampened on both sides and then, after being pasted, is put in place at one end and stretched to its utmost If it stretches beyond the margin, it should be cut off even with it. The book is then stood up to dry with the boards open as for filling in (see Fig.

126), so that they will warp After about a half hour, the boards are closed, and the book is put aside with a weight on it and with papers between the boards and end papers It is well to do this filling in before beginning to prepare the doublures, so as to allow plenty of time for drying.

Very frequently one hears bibliophiles complain of a bad binding job because the boards of a book curve in and will not lie flat. It is quite possible that the binder, in his zeal for guarding against "yawning boards," warped his boards too much, but more frequently the complained-of curved boards are due to the fact that the bibliophile carelessly left his book without pressure before the boards had time to "season." If he only realized the facts, this amateur (in the French sense) of books and bookbinding would be grateful to his binder for the insurance provided by him against "yawning bookboards," and in nine cases out of ten he could readily correct the curving tendency of the boards by keeping the book weighted

Leather Doublures Leather doublures should be pared to equal in thickness that of the leather margins (see p. 205). After the margins have been cut, it will be a simple matter to judge the thickness required for the leather doublure.

Having been pared, the doublure is cut to fit into the frame made by the cut-leather margins and hinge The leather is placed on a cutting tin, and a straight line is first cut along one long edge of it. An end is cut square to this edge, with the aid of a transparent celluloid square. It is well to bevel these two edges on the underside before cutting the width and length of the doublure, for if the first beveling is somewhat faulty, plenty of leather should be left to "play with," so that the edges may be recut and opportunity given for perfecting at least two bevels on the doublure. When these bevels are satisfactorily finished, the length and then the width of the doublure are cut. To measure for the

length, the squared corner is put in place, and the leather is gently but firmly stretched along the length of the margin, in order to find out how much it will probably be elongated when pasted It is marked where it is to be cut and is then cut on the tin with a very sharp knife, guided by a celluloid square. A measure is taken of the width between the margins, it is marked on the leather, and the leather is squared. This will leave two edges of the doublure to be beveled, and the beveling should be done very carefully, to produce a bevel the same depth and width as the one on the margins into which the leather is to fit.

Before the doublure is cut, the framework of the margins should be tested for squareness. If it is appreciably out of square — a fact that would denote very careless workmanship — the margins should be recut. Any slight deviation from squareness will not need to be compensated for in the cutting, as the leather may be stretched sufficiently to make it join properly with the margins.

It may have been observed that leather or paper, when cut to fill in a space, is always made smaller on either the length or the width, but never on both. This is because material is pasted in one direction only, in order to avoid its being pulled out of shape, and it will stretch only in the direction in which it is pasted This is a very important principle to observe in handling materials, and if observed, it will prevent many a failure. The more fragile the material to be pasted, the more care must be taken to direct the strokes of the paste brush in the same direction

When leather doublures are put in place, they are thoroughly pasted with a rather heavy starch paste from end to end and are doubled over so that the paste may sink into the pores of the skin. This first pasting of a material is always for the purpose of filling the pores, and the paste acts as a size to the material, sealing it up The leather is unfolded after a few minutes and is repasted One side and one end of it are then put in place and made secure, and

the doublure is drawn out so that it fits into the hollow that it is intended to fill The beveled edges are made to overlap the edges of the margins nicely, and the doublure is rubbed down and adjusted until it conforms exactly to its proper position When the doublure is finished, the covers of the book should be closed, and the book should be put away for about half an hour to dry, with papers between the boards and the end papers and with a heavy weight on it. It should then be looked at to see that the doublures have not "crawled" away from their positions, for in drying, a doublure is likely to shrink After any necessary adjustments are made, the book is put away as before and is left until the doublures are thoroughly dry. A help in placing the edge of the doublure will be found if straight lines are drawn with a folder and a straightedge along the beveled edges of the margins. These should, of course, be drawn at right angles to each other.

The word "doublure" is very evidently of French origin, and so far as I know, no other word has been substituted for it in English The word was doubtless derived from the Italian "duplicare," signifying a double fold It was borrowed from the French and has evidently not as yet been Anglicized. It signifies a "lining" in French and means a doubling of a material Usage in English has not yet determined whether it should be spelled "doublure," as in French, or "dublure," as it appears in some English texts Since it is apparently a word of French coinage, it would appear to be rightfully spelled "doublure" until English usage establishes a different spelling. The meaning, in any case, remains the same.

Silk and Other Woven Fabric Doublures. Doublures of silk or of other woven fabric are usually made by attaching the fabric onto the underside of a paper cut to a size that fills in the framework of leather on the board, and then tipping this fabric-covered paper into place.

Fabrics may be completely lined down on paper and used as doublures, but then fraying edges will probably have to be coped with, and the uncovered edges of the paper are unsightly even when tinted. Lining down fabrics will be discussed under fly-leaves, and I shall now indicate how to make a doublure which is "tipped on."

Before the doublure is prepared presumably the leather margins have been cut out and the filling-in paper has been put in place. A piece of any good handmade laid paper is chosen and is cut smaller than the size of the space inside the framework of the leather, the amount smaller dependent on the thickness of the fabric to be used. If the fabric is very thin, the paper is cut not perceptibly smaller than the space, for there need be then practically no allowance made for the thickness of the material as it turns over the edge of the paper. Each paper and board should be marked so as to identify the placement of the doublure in the framework for which it was cut. The grain of the paper should run counter to its length, and the silk should be cut with the grain running with its length This principle of having the grain of paper and the grain of fabric run opposite to each other is very important if a wrinkled doublure is to be avoided, for the opposing grains serve to keep the fabric taut. This is one of the two cardinal factors necessary to produce a smooth-lying doublure that does not cockle. The paper lining having been cut, the fabric is then cut one-quarter of an inch larger all round than the paper, with the grain running lengthwise The two doublures for the book are made together, as one may be worked on while the other is drying, and thus time is saved

Two pieces of binder's board are cut out, each about one inch larger all round than the cut pieces of fabric On top of the boards, pieces of unprinted news are laid, and then on each of the paper-covered boards a piece of fabric is placed, with the right side down The lining papers are laid on top of the fabric, with

identification marks uppermost. The papers are centered, thus leaving one-quarter of an inch projection of material beyond the paper on all four sides, and a weight is put on each to hold the material in place At one end (not side) of the fabric, the two corners are cut off on a line running diagonally to them and extending not more than enough beyond the corner to allow the fabric to be turned over and mitered without leaving an edge of

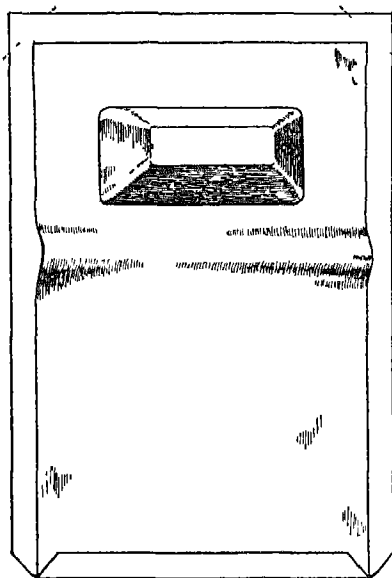



Fig 130

the paper exposed. This amount should be less than one-sixteenth of an inch when a medium grade of moiré silk is used for the doublure. It aids in estimating the amount of material to be cut off if the position of the paper on the fabric is outlined in pencil at the corners Excellent weights for such purposes as this are blocks of monotype or linotype metal (see Fig. 130). The lower faces of the blocks may be covered with a piece of split leather to keep the metal from sliding or marking the material.

When all is in readiness, one board is placed so that the cut corners of the fabric are farthest from the worker, and a piece of clean unprinted news is slipped under the fabric on the end with the cut corners. Some commercial paste is rubbed with the finger into the projecting edge of the fabric way up past the corners, with care not to allow the paste to go quite to the edge of the fabric. The wastepaper is removed and the fabric is turned over onto the lining paper with a small folder, with the edges kept even. At each corner, the tiny piece of fabric is folded over on itself at a slight angle After the turnover has been finished, a narrow strip of binder's board is put over it, and the board is weighted all along. This doublure is put aside to dry while one end of the second doublure is turned over. That is likewise put aside and weighted. Then the board holding the first doublure is turned so that the fixed end is next the worker. The lining paper is pushed back evenly toward the fixed end, forming a slight hollow underneath it, and a weight is put on the side of the hollow near the unturned end of the fabric (see Fig 130) The edge of the paper is marked and some of the projecting material may be cut off. Then the corners farthest from the worker are cut, and the fabric at the farther end is pasted and turned over onto the paper. A strip of board and weights are put on it, and it is put aside until the second doublure has its second edge turned over. The object of pushing the lining paper back is to give it a spring in order to stretch the fabric lengthwise, so that it will remain smooth indefinitely This and the principle of having the fabric and lining paper cut so that their grains run opposite to each other constitute the two important factors in preventing doublures from cockling. The amount necessary to pull the lining paper back differs with different fabrics The paper should be pulled back only enough so that it will be allowed to lie flat and not be shortened after the fabric ends have been pasted down With a firm fabric this amount is trifling.

By the time both ends have been turned over on the two doublures, the doublure first worked on will be dry enough so that the weights may be removed from it After the weights have been removed, the lining paper is pressed down and is straightened out. If it refuses to lie perfectly flat, it will have been pushed back in the making farther than enough to take up the stretch in the fabric, and it would better be unfastened at one end and redone before proceeding with the side turnovers The side turnovers are pasted one at a time and are turned over on a line with the threads of the fabric The corners are patted with a folder so that they are kept square and neat. When silk or other fabric doublures are finished, they should be put away between clean covered boards and left under a heavy weight until quite dry If calculation has been accurately made about the filling-in paper, the doublures should sink down into their leather frames when put in place, but it is best not to put them in place until after the book has been tooled A piece of newsboard is cut and tipped into the framework to protect the edges until the binder is ready to put in the doublures Some binders use glue for making doublures, but I prefer paste because it admits of a nicer adjustment when turning over the edges Glue dries so quickly that it fixes a piece of material in place directly that material comes in contact with another

Putting in a doublure is a simple procedure. The finished doublure is held in the hand or is placed on the bench on a clean piece of paper, and the turned-over fabric edges are permeated with a good strong commercial paste Some speed is required in doing the job, lest the paste dry before the doublure is ready to put in place A small brush or the finger may be used for the pasting. When pasted all round, the doublure is set into its frame of leather with due attention to how it is to be placed, and it is rubbed down, with a paper over it, until all four edges appear to be firmly adhered. For this operation glue may be used, but again I prefer

paste, on account of the opportunity it gives for adjustment of the doublure. Then, too, glue will permit the doublure to peel off, whereas paste makes a closer union with two fabrics because of its slow-drying quality, which allows it to permeate more deeply than glue, and two fabrics held by it do not often peel away from each other. They may become loosened in spots, but they will not peel in toto.

Application of the principle involved in making a smooth-lying doublure may be applied to other bookbinding processes. When any woven material is to be held in place by its turned-over edges, in order to make it lie smooth and flat, it should first be fastened at one end, then pulled tightly against that end and fastened at the opposite end Finally, one side is smoothed out and fastened, and the other side is held taut and is fastened, but material must not be pulled in opposite directions while being fastened, for then the grain is pulled out of line, with resulting pockets in the fabric. The binder would do well to observe these rules in putting a protective cover on his workbench, and armed with this information, he might even invade his domestic household and cover tables with oilcloth *et al.* with gratifying success.

FLYLEAVES

A flyleaf is a blank page at the beginning and end of a book. When the word "flyleaf" is used instead of "end paper," it somehow carries with it the suggestion that the blank page is not an ordinary white end-paper sheet, but is a special leaf of different character. For instance, we do not generally speak of leather or silk end papers, but of leather or silk flyleaves.

When a binding has leather hinges and a doublure of leather or silk, it is usually thought more in keeping to put leather or silk flyleaves in the book than to have plain or figured end papers, but I question the taste or practicality of using silk for doublures or flyleaves Silk does not seem to me a material suitable to combine

with leather and paper, and even a very good quality of silk fly-leaf will be split and worn when the leather cover and the paper text are still in perfect condition. Leather and vellum, on the other hand, are sturdy materials, and when used for flyleaves, they harmonize with the character of the bound volume. However, since silk flyleaves are in demand, a binder should know how to make them.

LINED-DOWN SILK FLYLEAVES. I have already described in detail, under End Papers (see p. 83), the making of silk lined-down flyleaves when they are to be used with leather hinges and concertina end papers, for the flyleaves should then be incorporated with the end papers as they are being made. The same procedure is followed in making the lined-down flyleaf when it is used with a leather hinge that is put in after the book is covered. After the silk has been lined down and let to dry, one edge is cut cleanly along its length, and a coating of heavy starch paste is worked along the edge with a finger, in order to seal it and keep it from fraying. Any clear size may be used instead of paste for this purpose. The leaf is then trimmed down, if necessary, so that it is very little larger than the text, for it is easier to handle, after being glued, when it does not extend too much beyond the text.

On that part of the leather hinge which is pasted over the joint onto the end paper, one point is marked at each end of the book to indicate how far the silk flyleaf is to come up toward the joint. These two marks should be put about one-eighth of an inch out from the joint. A wastepaper is then slipped under the first end-paper sheet, to which the silk flyleaf is to be attached, the back of the flyleaf is glued with thin glue, and it is put in place on the end paper with its straight edge just up to the two marks made on the leather. Where the flyleaf joins the leather it is rubbed firmly. Then the white end paper on which the flyleaf is to be lined down is glued over with a thin glue up to where the back of

the flyleaf has been attached to it and the flyleaf is let to fall over the glued paper After it is lightly smoothed out overall with the palm of the hand, a tin is put between it and the cover board. With a sharp knife and straightedge, the three projecting edges of the flyleaf are cut even with the end paper. The book has, of course, been turned over so that the underside of the end-paper sheet is uppermost, in order that it may be used as a guide for cutting The book is then turned with the flyleaf uppermost, and with a fresh wastepaper under it, it is well rubbed down with a folder through a piece of clean paper. The best position for the book in placing the glued flyleaf is with the fore-edge toward the worker.

After the second flyleaf has been glued in, thin covered tins are put under the freshly glued leaves, the book is closed, and covering tins are inserted between the covers and the flyleaves The book is put aside between two boards and is weighted with a lithographic stone and left until the flyleaves are thoroughly set. Then some thick starch paste is carefully put on the three exposed edges of the flyleaves, and if the head of the book has been gilded, a little shell gold may be painted on the edges at the head of the book

Any other fabric may be lined down and used as a flyleaf in this manner, but no flyleaves should be put in as an afterthought. They should be planned for while the book is being constructed, and provision should be made for their thickness by stuffing the joint of the book with paper before it is backed. The stuffing paper is pulled out before the flyleaf is put in place.

The method of lining down materials varies with the character of the material When a material is loosely woven, paste or glue should never be applied to it directly, the lining paper should be glued lightly with thin glue, and the material applied to it and rubbed down. In most instances when glue is used, it should be applied to the paper and not to the material.

To line up a closely woven fabric like airplane linen, paste is best used, for it is less a surface fixative than glue in that it penetrates more deeply. With a tightly woven material, some penetration is desirable to prevent its peeling off A thin bond paper or a heavy Japanese tissue paper is chosen for the lining. The linen and the paper are cut with the grain running the same way, in order to make the lined material more supple The paper is dampened very slightly, so that it will contract and dry with a smooth surface It is then pasted with a thin paste and is placed on the linen and rubbed down thoroughly with a folder, through a piece of paper. It is put away to dry between binder's boards, with a weight on it After being lined up, a material of this kind may be cut successfully in a cutting machine.

TIPPED-ON FLYLEAVES The making of silk and other woven material doublures has already been described. Flyleaves that are tipped on are made in the same way. Finding the measurement for the lining paper involves acute calculation and judgment, in order to produce a flyleaf that will not extend too evidently beyond the end paper to which it is fastened

To measure for the lining paper of a flyleaf, first two marks are made on the leather that extends over onto the end papers, and they are placed at each end of the book about one-eighth of an inch out from the joint, as for lined-down flyleaves. Then, for the lining paper, a piece of rather thin handmade laid paper, with the grain running with its width, is cut a little larger than the end paper A tin is put under the end paper to support it, and the lining paper is placed over the tin and under the end paper, with one straight edge coming on a line with the two marks made near the joint on the leather A weight is put on the end paper, and pencil marks are made on the three sides of the lining paper extending beyond the end papers, to indicate their edges The underside of this lining paper is marked with a letter or a cipher

next to where it rests along the joint, and the same mark is put on the upperside of the end paper near the joint, to indicate how the flyleaf is to be placed when it is glued onto the end paper. The lining paper is then placed on a tin and, with a knife, is cut on three sides just within the marks made. Unless the fabric to be used is quite heavy, no appreciable amount should be cut off to allow for its thickness when it is turned over the edges of the paper. The paper should be tested for size before it is used, and then the flyleaf is made up in the same way as a silk doublure

To put the flyleaf in place, a tin not much larger than the end paper is inserted under the end paper, and the book is turned so that the back is toward the worker. The flyleaf is then glued with thin glue, and with care taken to turn it so that the two marks will coincide, it is placed on the end paper from the fore-edge That is, the fore-edges of the flyleaf and the end paper are put together first, and the flyleaf is let to fall in place toward the joint. If the measurements are correct, it will fall about on the line indicated by the two marks on the leather next the joint It is rubbed in place with a folder over a piece of paper, first on the upper and then on the underside of the flyleaf. After the two flyleaves are put in, a thin covered tin is placed under and over each of them, and the book is put aside under a lithographic block

LEATHER FLYLEAVES In order to use leather flyleaves, there must be a leather hinge in the book. The leather for the flyleaf is pared very thin, and it must be pared evenly. When it is reduced to the desired thinness, one straight edge is cut along its length. It is trimmed down until it is only a very little larger than the end paper on which it is to be glued, and its edges are all thinned out. The straight edge is beveled off evenly to a paper thinness all along its length A piece of wastepaper is put under the end paper, and the end paper is glued almost up to the joint. The straight edge of the leather, which comes next to the joint, is

placed on a paper and is glued lightly but thoroughly for about one-eighth of an inch deep on its underside The waste paper is then pulled from under the end paper and the glued edge of the leather is placed almost up to the joint and is let down onto the end paper. It is first smoothed out with the hand, and then, with a paper over it, is rubbed down thoroughly with a folder. It is left to dry with protection papers on each side of it, while the second flyleaf is put in place Before the leather is cut even with the edges of the end papers, it is well to put the book aside under a weight after both flyleaves have been put in place, for the leather is apt to "crawl," while damp, unless it is well weighted When the fly-leaves are well set, the leather edges beyond the end paper are cut as described for lined-down flyleaves, and then the book should be kept under pressure with proper protection against dampness for several hours, at least It will improve the appearance of the flyleaf at the head if a little shell gold is painted over the edge

Vellum flyleaves are best made by being folded around a concertina end paper and sewed in with the section Directions for making them are given in Chapter VI under "End Papers."

CHAPTER XVII

FORWARDING

Half Bindings. Books of Reference Library Binding Books of Music and Albums

HALF BINDINGS

THE processes in binding a book in half leather are the same as for a full leather binding up to the point of cutting out the leather cover. I have already described in Chapter XIV the manner in which leather for half bindings is cut and pared.

After being pared, the leather is pasted and is put on the back of the book as for whole bindings. It is brought over onto the sides of the boards and is rubbed into place. Then the book is put aside to dry. Later, the four leather corners, which have been marked with the corner pattern and cut off so that a neat corner may be turned in, are thoroughly pasted with starch paste and are put together in pairs with their pasted sides inward. After they are allowed to remain together in this manner for a few minutes so that the pores of the skin may be filled with paste, two corners at a time are repasted and are put in place on the book, each in turn, tucked in and mitered as for corners of a full leather binding The other two corners are now put in place, and the book is put aside to dry for at least an hour. Celluloid sheets are inserted under the covers of the book, to prevent any moisture from penetrating the text.

The leather coming over the sides of the book and along the diagonal edges of the corners will be somewhat uneven and must be trimmed To trim the leather sides, wing dividers are used to find the shortest width of the leather, measured from the joint of the book This width is marked on the leather near both the head and tail with one point of the dividers, and the leather is cut through the points with a sharp knife, a straightedge serving as a

guide. To cut the corner leather, the corner pattern is put in place over the leather, which is cut with a knife along the diagonal line of the pattern. The surplus leather is then removed from all the leather edges.

The leather edges on the sides of the book will now be straight and even (see Fig. 131), and a piece of material must be cut to fill in between the thickness of the leather coming over from the back of the book and the leather corners. For this purpose a piece of cartridge paper is used if obtainable, or newsboard may be used. A piece of filling-in paper or board is chosen of a thickness equal to that of the leather. It is cut a little larger than the space to be filled in, with one clean, straight edge along its length, and

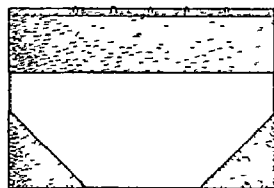



Fig. 131

it is then squared at one end. The long, cleanly cut edge is put in place against the side of the leather, and the squared end is placed even with one edge of the length of the bookboard. The length and width of the bookboard are then marked on the filling-in board, and it is cut to size. It must now be cut off to fit into the corner leathers. In order to do this, the filling-in board is put in place on the outside of the book, and when it is raised slightly at the corners and held firmly in place, the outline of each corner may be noted, and the board is marked to denote the size of the corners. The board is then cut off on a tin with a knife and straightedge on the indicated marks. It is well to leave a generous allowance for the board and recut it if necessary, for this mode of measuring is of the trial-and-error variety which is a manner of

measuring not often used in hand bookbinding. Each filling-in board should be marked on the inside to correspond with the mark put upon the cover board opposite it, so that it may be identified for placing. Otherwise it may not fit, for handwork at best is not one hundred per cent accurate. When finally cut to fit between the corners and leather side, each filling-in board is glued with a thin glue and is put in place and rubbed down.

The next procedure is to cut the material for the sides of the book. Marbled paper, block paper, linen, or a variety of materials may be used for this purpose, providing they are not too delicate in texture. The material is cut about three-quarters of an inch wider than the distance between the edge of the bookboard and the edge of the leather on the side, and about one and one-half inches longer than the bookboard. Two marks are made with the folder near each end of the book and about one-sixteenth of an inch inside the edge of the leather on the side Two marks are likewise put the same distance inside of the edges of the leather corners — one near each end. The straight edge of the filling-in material is placed up to the marks on the leather along the back of the book, a weight is put on to hold it firmly, and the material is creased sharply at head, tail, and fore-edge along the broad edges.

With the back of the book toward the worker, the material is folded back wrong side out at each corner on a line corresponding with the two marks previously made, and is creased sharply back on this line and down over the two edges of the book. It will then have creasings made as shown by the lines in Fig 132 Line A is cut on a tin with a knife and straightedge up to point L. Line B is cut to point M, line C to point N, line D to point O. Then the lines between points L and M and between N and O are cut, and the pattern of the material will be like that shown in Fig. 133.

This cut material is then glued with a very thin glue and is put in place on the sides of the book up to the marks indicated along

the leather at the back. It will fall properly in place on the corners, and it is rubbed down quickly with the palm of the hand and is turned over the edges and smoothed out on the inside of the board A piece of paper is placed without delay over the out-

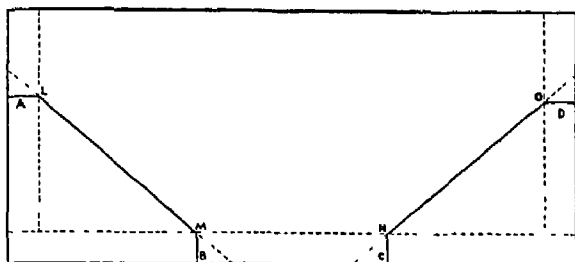



Fig 132

side, and the material is rubbed down with a folder, care being taken to see that the edges along the leather are sticking firmly.

The book is now ready to have a filling-in paper put on the inside of the board Stout wrapping paper is better used than news-

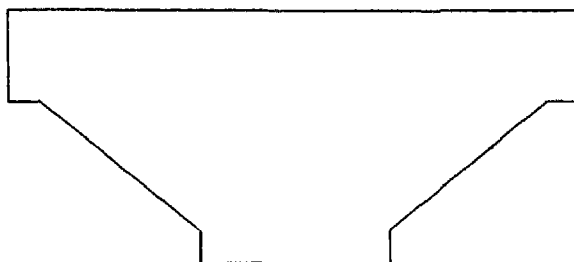



Fig. 133

board for filling in half bindings The process of cutting and pasting in the filling-in paper is the same as described for filling in full leather covers (see p 222), except that the paper is dampened on both sides with a sponge before being pasted. After being filled in, the book is stood up to dry (see Fig. 126), and after

about one-half hour it is put aside under pressure and is left overnight. The following day the end papers may be cut and pasted back as for a full leather binding (see p 224), though not much more than one-quarter of an inch is allowed for the margins on the leather and paper turnovers. Before the filling-in papers and the end papers are cut, it is important to note how far the end papers will extend over the board at the fore-edge.

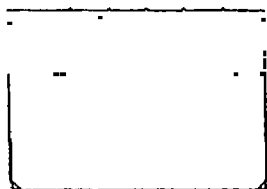



Fig 134

When a half binding is made without the usual leather corners and paper sides or when sides made of some material of delicate texture are used, there should be corners of vellum, leather or binder's cover cloth put on the book before the sides are glued on These corners may be allowed to show, as in Fig 134, or they may

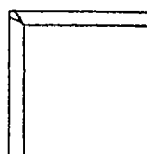



Fig 135

be put on after the French method, so that they do not show on the sides of the book, but are visible on the board edge at the corners and on the inside of the bookboard The inside pattern of the French corner is shown in Fig 135

If vellum or leather is used for a small corner on the outside of a cover, the material is cut in miniature size like regular leather corners and is pasted and put in place before the filling-in pro-

cess has been completed and the cover sides are glued on. When the French type of corner is used, the material is usually binder's cloth of a shade matching as nearly as possible the color of the leather used on the back and sides of the book Leather or vellum is not advisable for this purpose, as leather will not stand the wear on a corner that book cloth of best quality will endure, and vellum is too refractory to be turned over easily and neatly when so small a piece has to be manipulated

The cloth for these hidden corners is put on before the filling-in boards are glued in place It is cut into strips about one inch long and one-half inch wide. The pieces are thoroughly pasted

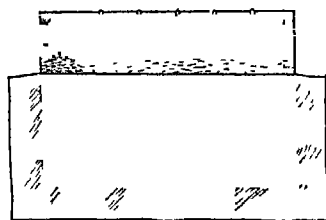



Fig 136.

with a heavy paste and are put in place and turned over the board edges onto the inside of the cover as for large leather corners. The filling-in board is glued in place after the corners have been put on This board is not cut out at the corners, but is cut flush with the cover board at the edges The paper sides are also cut differently from those used on a regular half binding. Instead of being cut off diagonally to fit the leather corners, they are left with squared edges extending beyond the cover board at head, tail, and fore-edge When cut, they are glued and are placed over the edge of the leather which extends along the sides of the book (see Fig 136). The book is then turned over so that the freshly glued paper rests on the workbench. A circular pencil mark, which just touches the corner of the board, is made on the paper,

as shown in Fig. 137. The paper is cut with the shears at each corner along this mark, and the edges of the paper are then turned over onto the inside of the board and are smoothed down.

This type of corner leaves a small V-shaped pattern of the cloth at the corners on the inside margin (see Fig 135), and since the paper is cut up to the board corner, the cloth will also appear on the board edges, where it is intended to be exposed in order to take the wear which paper or other delicate material would not withstand It will be found that this type of corner is the most successful model to employ when a large-figured material is used on the sides of a book, for the cover would suffer in artistic effect, if the paper were cut off at the corners.

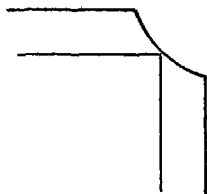



Fig 137

There is no particular reason why the traditional triangular leather corners should be used on a half binding Square or oblong corners may be used quite as well, and they often lend themselves to the scheme of decoration designed for a binding A strip of leather may also be used along the fore-edge of a book, often with good effect, in which case shaped corners are not needed

BOOKS OF REFERENCE

Heavy books of reference or other large tomes that must stand much wear and should open freely for the convenience of the reader are best not sewed "flexible," or over cords. All the sections of this type of book should be made sound, and whipstitching, or overcasting, is to be avoided, for this prevents the pages from

opening all the way to the back and makes for a very stiff-paged book.

End papers should be of strong, handmade paper and are best made with an accordion pleat (see Figs. 45 A, 45 B) If extra strength is called for where the board hinges to the book, a piece of fine, thin cambric should be pasted under the upper fold of the end paper to reinforce it over the joint.

The book should be sewed over strong, unbleached tapes, and every fifth section should be catch-stitched as the sewing progresses (see Fig 69 C). After being sewed, the book is rounded and backed as previously described, and in order to make for flexibility, double or split boards are used for covers They are attached to the book by inserting the ends of the tapes between them instead of by lacing the tapes through them This is necessitated by the fact that the boards are left out from the joint of the book to form what is known as a "French joint" This joint allows a freer opening than an ordinary joint used with laced-in boards.

To make a pair of split boards, a thin binder's board is glued to a thinner board or to a piece of strawboard Pieces of the two thicknesses of board are cut out large enough to make two cover-boards. Down the center of the thinner board and across its width, a strip of heavy chipboard, about four inches wide, is placed, and the board is then well glued. The chipboard is removed, the thicker board is laid on the glued board, and the two boards are then nipped up in the press. At first the nipping pressure should not be heavy or sudden, for fear of forcing the glue out between the boards After a few moments the pressure is increased and the boards are left to dry in the press

When dry, the double board is cut through the center, and thus two boards are made of it These boards will be glued together except for a space about two inches wide on one long side If the boards required for the book need to be very large, it may be

more convenient to make each board separately, gluing it so that an unglued space will be left on one long side.

The head of the book is cut in the guillotine cutter after the book is glued up, but before it is backed

The ends of the tapes are cut to a length of about three-quarters of an inch, and they are glued down on the protection sheet The protection sheet is then folded over the glued-down tapes at a distance about one and a quarter inches from the joint of the book and is cut off on a line with the joint. The underpart of the folded paper is glued and is lined down over the tapes At each

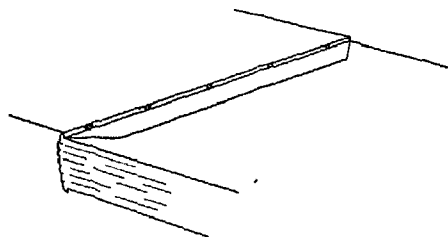



Fig 138

end, it is cut off at an angle as shown in Fig. 138, so that it may be more easily slipped between the double boards

The length of the boards is then cut square to the size required for the book, and the usual eighth-of-an-inch overhang is left for squares at head and tail The width of the boards is cut a trifle more than one eighth of an inch shorter than the width of the text, the measure being made from the joint. This will allow the split board to be placed a little more than one-eighth of an inch out from the joint and still project one-eighth of an inch over the fore-edge to form the book-square as shown in Fig 139

To put the boards in place, one split board at a time is opened at the back, or unglued, edge and glue is inserted between the opened boards The glued-down tape-piece is slipped between the freshly glued boards and is adjusted so that all three book-

squares are even. Then the boards are pressed together After the second board is placed properly, the book is nipped up in the press and is left until the boards are firmly glued together at the back.

Headbands may now be woven onto the book at head and tail, if time and expense allow, or they may be dispensed with and a piece of cord may be stuck in under the leather turn-ins at head and tail when the book is being covered This sort of headband serves its practical purpose very well, though the decorative value of a woven headband is sacrificed The back of the book is now

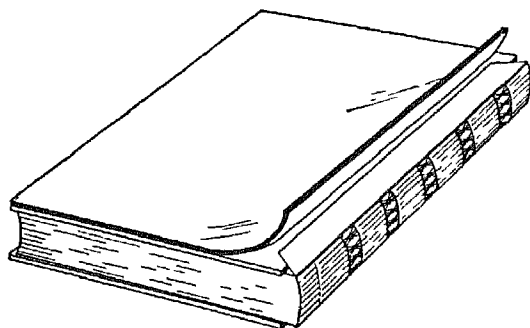



Fig 139

lined up as for a regular flexibly sewed binding, and the book is ready to be covered

The leather is pared as previously outlined, whether for half or full binding, though it may be left full thickness over the joint, and the book is covered in the usual way After being covered, a piece of cord is tied around the book over the joints, and the book is nipped in the press. The joints may be more definitely defined by running the blunt end or the side of a folder along them

When a book is bound in half leather after this fashion, the corners should be protected with vellum or cloth, either partially concealed, as in a French corner, or showing slightly on the sides

of the book. Both of these methods have been described in the foregoing directions for regular half bindings.

The forwarding of the book is finished in the usual manner, but when the end papers are pasted down, if a linen hinge has been used for reinforcement, the linen is pasted down on top of the end papers before they are lined down on the covers, and the pasted-down linen is pasted with the end papers when they are put back over the coverboard.

The type of binding just described is of English origin The French use a similar method for binding books, which is known as a "Bradel" binding or a binding "en gist" (see p 182).

Fig 140.

LIBRARY BINDINGS

Library bindings would best be constructed in the manner just described, but the expense is prohibitive in this country for most public libraries Specifications for library bindings will be found in books named in the Selected List of Books at the end of Volume I.

BOOKS OF MUSIC AND PHOTOGRAPH ALBUMS

Books of music or albums, if bound like books of reference, are strong and serviceable, but in binding music, the sheets should be hinged like a book composed of plates (see p 49) in order to secure the most practical result. The only difference between guarding plates and sheets of music is that the paper, when cut along the back, need not be pared when the sheets are mounted, since the paper on which music is printed is not bulky. The pages

in photograph albums are mounted like plates, and around each fold a guard is folded in order to stuff the book at the back (see Fig. 140), so that when photographs are pasted in, the book will lie flat.

CHAPTER XVIII

FORWARDING

Limp Bindings. Pamphlets and Thin Books. Vellum Bindings. Embroidered, Woven Material, and Velvet Bindings. Casings. Portfolios

LIMP BINDINGS

LIMP bindings are usually not flexibly sewed, for they would better not have raised bands. When a book is to be bound in limp covers, it is best to sew it on tapes. The book is then backed with a very slight hinge, and the ends of the tapes are cut off to a length of about five-eighths of an inch and are pasted down on the outside of the last end-paper sheets. The book is headbanded, and the back is then lined up with super or with thin cambric, which should extend over the headbands and over the sides of the book about five-eighths of an inch. The back lining, after it has been glued on, is cut off even with the headbands and even with the text of the book where it extends over the sides. The two side extensions are cut off on both ends at an angle, as for books bound in double boards (see p. 254).

The back is then lined up with a piece of tough wrapping paper (see p. 177). Cover boards are cut out of "redboard" or "newsboard." Both of these materials are flexible and bend without breaking. The redboard is the more flexible and should be used for small books such as prayer books. A limp book is usually made with a narrow French joint, and the boards are cut like those for a book bound with double boards (see p. 254), except that only one-eighth of an inch, instead of one-quarter of an inch, is allowed for the joint. They are used unlined. A strip of redboard is cut the same length as the cover boards and the width of the back. To take the measure for the back width, a strip of paper is used, as a rounded surface cannot be accurately measured with a pair of dividers.

A paper pattern for the leather is then made. It is made like that for a full leather binding (see p 187) except that in estimating for the allowance between the two boards there is added to the width of the back one-quarter inch, which represents the one-eighth inch taken up on the two sides of the book for the French joint In other words, the whole width of the leather must be computed by adding the width of each board to the width of the back, plus one-quarter inch for French joints, plus about one and one-quarter inches for two turn-ins The leather for each turn-in need be not more than five-eights of an inch The height of the leather will be the length of the board plus one and one-quarter inches for the two turn-ins

The leather is cut from the paper pattern and is marked up. To mark it up, one of the cut boards is placed about five-eighths of an inch from one end and is marked all round as described on p 196 One-eighth of an inch from the line indicating the farther side of the board, another line is drawn parallel to it, using a straightedge Beyond this line the width of the back is marked by a line, and then at another distance of one-eighth of an inch a line is marked to represent the boundary of the second French joint A board is placed on the last line and on a line with the top of the marking for the first board. Its place is outlined by lines all round it (see Fig 141).

The four turn-ins are pared quite thin so that they can be neatly turned over the thin boards No other paring is done except to thin down the leather slightly with the French knife between the marks for the French joints The leather is marked up again accurately after the paring is finished, indicating the width of the back, the French joints, and the outside boundary lines of the boards

To make the cover, one board at a time is glued with thin glue and is put in place; the strip for the back is glued and is placed within the lines marking the back The boards and backstrip

must be placed from the same end, with care to line them all up in a straight line. The boards having been placed, the cover is rubbed down on both sides with a folder. When the leather side

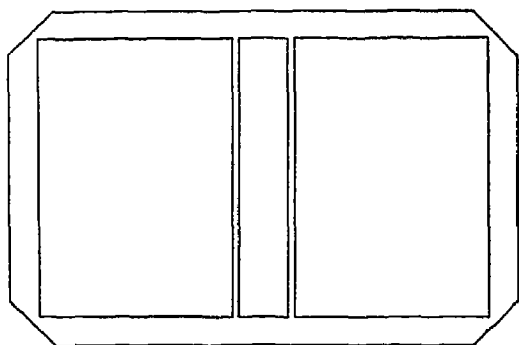



Fig 141

is being rubbed down, a piece of clean paper should be put over the leather. Then the turn-ins are cut at the corners like those of a regular binding (see Fig 142) Or if rounded corners are used, as for a prayer book, the leather is not cut, but is turned over at

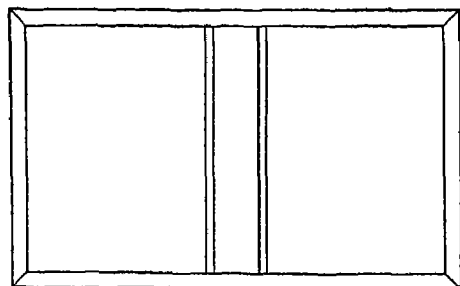



Fig 142

each corner after all the turn-ins have been turned. The leather turn-ins are pasted and turned over the board one at a time, the head and tail are turned first The fore-edges are then turned over, and they are mitered when the boards have square corners

(see p 197) If the corners have been rounded, a little paste is put on the inside of the leather and each corner is "fulled" over on the inside of the board with the point of a finishing folder by running the point down the leather diagonally from the corner to make very fine pleats or gatherings After all the gatherings have been made even, the leather is pressed down firmly with a folder and made to lie smooth To avoid too great thickness, the leather at the corners is thinned after the paring of the turn-ins is completed.

The cover is now finished and is put aside flat and weighted until needed, though it may be used at once This cover is made exactly like a casing for a limp-covered book, and when done in this way the book will be a cased book. The backbone of the cover should be titled and tooled before it is put on the book. The sides of the cover may be tooled later

When the book is ready for its covers it is pasted into them The back of the casing should first be rounded by placing the book in the casing and shaping the backbone with a folder to conform to the contour of the back of the book. A piece of paper should be put over the leather when the back is being moulded into shape A clean piece of wastepaper just a little larger than a page of the text is then put between the front end paper and the book, and the upper side of the end paper is pasted with very thin paste First the super lying over on the side of the book is pasted down on the end paper, and then the whole end paper is pasted with strokes of the brush directed toward the fore-edge. The wastepaper is removed, and the book is set into the cover by placing the pasted side down exactly along the edge of the redboard backstrip, with even squares left at head and tail. The book is not let to fall until accurately placed When it is placed, the end paper lying on the board is smoothed out with the hand Then the second end paper is likewise pasted, and the uppermost cover is brought over onto the book with the left hand and is lined up with the lower cover The book is taken up from the bench and is

adjusted so that the two cover fore-edges are even. The second end paper is smoothed out with the hand, the book is closed, and the edge along the side of a folder is run down the sides of the book between the back and the edges of the board, to outline the French joint. The front of the book is placed first, because the first-placed side is less likely to have a wrinkled end paper

When finished, the book is put aside between boards without tins under the covers and is heavily weighted It should be looked at after about a half hour to see that the end papers on the cover boards are smooth and are not sticking If not smooth, they should have a piece of clean paper put over them and should be rubbed with a folder. If they stick to the end papers on the book, they are freed by running a folder under them and lifting them away from the boards.

PAMPHLETS AND THIN BOOKS

A book like a pamphlet, consisting of but one section, is best cased. It may be cased as a "saddleback" book, that is, with a rounded back, or as a square-back book

If a book is cased with a square back, a piece of fine cambric is pasted along the back of the section, extending to within five-eighths of an inch from each end of the book and about five-eighths of an inch over each side of the book

The section is then sewed by entering a threaded needle from the inside at about its center The needle pierces the cambric, and the thread is drawn through the back, leaving a short end inside of the section The needle is then brought back through the section at a point about three-quarters of an inch from one end of the book, and the thread is drawn through the book. The needle is again inserted through the first hole made in the center of the section, the thread is pulled through to the back, and the needle is inserted from the outside about three-quarters of an inch from the second end. The thread is drawn through into the inside of

the section and is tied twice in a hard knot to the end of the thread left in the fold of the section Then two folded end papers are cut to the size of the text, and one is pasted on each side of the book (see p 73) under the cambric and up to the line of the back A casing is made like that for a limp-covered book, except that the backbone board is cut from heavy chipboard or a Number 50 cloth board, and the side boards are made of the same material. The side boards are cut to extend just short of the back of the book, as it is not possible to make a French joint successfully on a book of a single section Before using the boards to make the casing they should be sandpapered off along their back edges, and the backstrip should be sandpapered along its side edges. The book is then cased as for a limp-covered book

If a saddleback, one-section book is to be cased, one sheet of white paper and one of colored paper, or two sheets of white paper, are folded around the section after being cut to the height of the book. The fore-edges are cut off after the book has been sewn. Then a strip of muslin is pasted onto the back as for a flat-back, one-section book, and the book is sewed and stitched through the muslin guard as just described If the guard is not used, the book will crack on the inside along the joint. A casing is made, using a piece of supple redboard for the backstrip, and the book is cased as for a limp-covered book.

Very thin books composed of only two sections would best be sewed on tapes and treated in this way, as they cannot otherwise be backed and a joint be gotten on them Thin books of more than two sections may be bound flexibly or sewed on tapes, depending upon the thickness of the sections. They are bound like a flexible binding.

VELLUM BINDINGS

It is advisable to bind a vellum-covered book in stiff boards, for vellum cockles in almost any climate and especially in the Ameri-

can climate, where atmospheric changes are both sudden and intense.

The book should be sewed on tapes, as a hollow back must be used. Vellum cannot be pasted directly to the back successfully, and if a tight back were used, the opening of the book would be too stiff The book is bound like books of reference with split boards (see p. 252), except that the vellum is lined with a good quality white paper before covering. The boards should also be lined with white paper.

To line vellum, the paper is pasted and the vellum put down over it after the cover material has been cut for the binding. A rather heavy, smooth starch paste is used, and after it has been applied, the paper is "skinned" by putting another clean paper over it, rubbing it lightly with the hand, and removing it at once. This evens the paste and eliminates any brush marks that might show through the vellum. When the vellum has been lined it is put in the press between flesher-covered boards or between boards covered with pieces of blotting paper, and is nipped up tightly

The vellum cover should be put on the book at once, while still damp. If it is found to be too stiff to turn over the boards it may be softened by dampening it with a little warm water.

After the book has been covered, as outlined for split-board books, a piece of cord is tied around the book over the joint and over the headcaps The cord should be knotted at one end over the text to avoid marking the sides. Sheets of celluloid are then placed under the covers, and the book is sharply nipped in the press. It is then left to dry, heavily weighted, before having the end papers pasted down

In spite of any extra warping papers pasted on the inside of the boards of a vellum-covered book, the covers tend to curl back in the American climate, and all books bound in vellum must always be kept stacked closely on shelves or weighted, when not in use

EMBROIDERED WOVEN MATERIAL, AND VELVET BINDINGS

When books are to be covered with embroidery, silk or any woven material, the material should be lined like vellum. The back should be smooth, without bands, and the specifications for the binding are the same as for any split-board book

In covering, glue is used instead of paste (except on the turn-ins), because the material is "set" at once with glue and there is no danger of stretching it The back of the book is glued first. The glue should be used thin, and before it is applied it should be foamed up in the brush on a piece of paper With the material marked up on the inside and lying on the workbench, the back of the book is glued with thin glue and put down in place. The material is turned in at once at the head and tail, with the back of the book resting on the bench A piece of paper is placed over the back and is rubbed with a folder until the material adheres firmly to the book. As the rubbing is being done, the book should be placed first on one side and then on the other in order to rub down the material over the joints After the back has been thoroughly rubbed down, one board at a time is glued, and the material is pulled over and rubbed into place Finally, the turn-ins are mitered at the corners, and at head and tail each turn-in is given a light coating of heavy starch paste, preferably applied with a finger, and is turned over. Then very carefully a little paste is rubbed on the edges of the mitered fore-edge corners to keep them from fraying, and they are turned over Paste is used for the turn-ins, as it is not so liable to soil the material as glue, and more time is allowed for the work, since paste dries more slowly than glue Glue may be used instead of paste, but must be very carefuly applied.

If either glue or paste gets on the outside of the material, it may be removed by holding it over a steaming kettle of water. The

glue or paste is thus moistened and can be wiped off. If velvet is used, it should be steamed again after the glue or paste has been taken off. Books covered in embroidery should have the corners stitched with a fine buttonhole stitch. If well done, this adds to the finish of the corners

When a padded effect is desired on the sides of the covers, they are not glued in place. Before the book is covered, a piece of cotton batting is cut to the size of each board. It is fastened to the outside of the board by putting a few dots of glue here and there on the board and laying the cotton in place. A piece of thin cheesecloth is cut for each board of the book, allowing one-half inch over the length of the board on each end and one-half inch on one side. It is laid over the cotton just up to the back edge of the board and is fastened by turning it over onto the inside of the board and pasting it down, as for mounting doublures (see p. 237). The turn-in at one end is pasted down first, the cheesecloth is drawn tightly, and the opposite end is pasted down. Then the fore-edge turn-in is pasted and turned over. The material is now glued onto the back, and without any further gluing it is brought over the sides of the cotton-covered boards, is turned over the board edges, and is pasted down on the inside as it is when the material is glued to the outside of the boards.

Velvet-covered books are bound in the same way, and their sides may be padded if desired. However, this material should not be rubbed heavily with a folder, for fear of matting the pile It is best to press velvet down or, with a paper over it, to rub it with the hand. A thorough steaming after covering improves its appearance.

CASINGS

The word "casing" is the name given to a book cover that is not built up as a part of a binding during the process of forwarding, but is made separately and put onto a book after the book has been forwarded to a point where it must have a cover.

Casings may be made of almost any covering material. Cased books may be covered with whole cloth, with "full leather," or with "half leather" and cloth or paper sides

A book to be cased is sewed on tapes and is forwarded to the point of covering, like a book with limp covers Headbands may be worked on the book by hand, or they may be cut from a ready-made strip and glued on If commercially made headbands are used, the super does not extend over the headbands but is cut to fit in between the endings of the headband strips glued on the back. Therefore these headbands do not need to be cut off at an angle where they extend over the sides of the book.

The back of a cased book may be round or flat. When flat, the book is not backed, and the backstrip in the cover, or casing, is made of cloth board that is a little thinner than the boards used for the sides. This prevents the cloth from breaking over the hinge. When the back is to be round, the book is backed like a book "bound flexible," and the backstrip of the casing is made of redboard.

HALF LEATHER CASINGS. If the book is to be cased in "half leather," the leather is pared as for a regular half leather binding. The width of the back and of the French joints and the length of the boards are marked on the pared leather Then a line is drawn on each board at a distance from its back edge equal to the distance the leather is to project over on each side of the book A piece of folded wastepaper is placed up to the line to cover the front of the board, and the exposed part of the board is glued, is put in place on the leather, and is rubbed down. The second board is glued in the same manner and is placed on the leather. Then the backstrip is glued and is put down between the two lines marked for the back. The turn-ins at head and tail are pasted and are turned over, and the casing is finished like a half binding without leather corners After the leather is placed and

rubbed down, vellum or cloth tips are pasted over the four corners of the cover, the leather is then trimmed, the sides of the cover are filled in with newsboard, and the cloth or paper for the sides is put on and turned over (see p. 250).

Full Leather Casing. A full leather casing is made like a limp-covered book except for allowing one-quarter of an inch, instead of one-eighth of an inch, for each French joint

Whole Cloth Casings If the casing is to be covered in "whole cloth," the cloth is cut out with the grain running from fore-edge to fore-edge, and it is then marked up as for a limp leather binding with one-quarter of an inch allowed for each

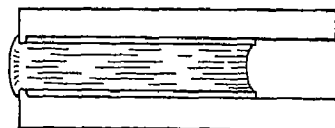



Fig. 143.

French joint. The cloth is cut diagonally at the corners and is then glued all over with very thin glue. Each board is put in place on the glued cloth, then the backstrip is placed, the casing is turned over, and its entire surface is rubbed with a folder The casing is turned again so that the inside is uppermost, and the turn-ins are turned over the edges of the boards. When the turn-ins are uneven or too wide, they are compassed off with dividers to the desired width and are cut even with a knife and straight-edge. Figure 142 shows the inside of a finished full cloth casing Glue must be used very thin when gluing cloth, for otherwise the cloth will not lie smooth It should also be used mediumly hot. When a cloth-gluing job results in a bumpy appearance of the cloth on the outside of the casing, the glue used was too thick. This also applies to paper put on with glue. A good quality glue may be thinned down until it runs from the brush almost like

water, and still retains sufficient adhesive strength to make cloth or paper adhere firmly to a binder's board.

A casing may be used at once after being made, or, if put aside, it must be heavily weighted If the back of the book is round, the backbone of the casing should be rounded by putting it in place on the book and shaping it to conform to the back of the book, before "casing-in " The book is "cased," or put into its covers, as described for a limp binding, except that after the book has been cased, it is put into the standing press between two "cloth boards."

Cloth boards have a metal projection over their back edges, and when the book is put between them it should first be squared up and the back should be adjusted until it is perfectly symmetrical. This can be done most satisfactorily by holding the book in the left hand with the back uppermost and pressing its boards down against the palm of the right hand It is then put in the press with care to place it so that the metal projections of the boards fit into the French joints (see Fig 143). It is well to outline the joints with a folder before pressing the book. No tins are placed between the covers When the book is properly adjusted in the press, the press is wrung down sharply, and the book is left for about ten or fifteen minutes. It is then taken out of the press to see that the end papers are not stuck If they are sticking to the papers on the boards they are freed by carefully running a folder under them and flipping them away from the boards Sticking end papers are generally caused by the use of too much paste or by the penetration of thin paste through a lightly sized end paper. After the end papers have been freed, the book is put back in the press as before, under heavy pressure, and is left until the following day. It is best left in the press for a week.

All casings should be titled and tooled on the back before casing-in "Casing-in" is the term used to denote the operation of pasting a book into its casing.

PORTFOLIOS

Portfolios are made like casings (see p. 268). After the material has been glued on the outside of a portfolio and has been turned over, a lining of paper or of some other material is glued on the inside, as a finish

It is usually best to cut the lining material into three pieces. One piece for the back is cut wide enough to cover the backbone strip and extend about one-quarter of an inch over each board at the back, and long enough to cover the height of the board minus about one-quarter of an inch. The other two pieces are cut for lining the sides Each should be about three-eighths of an inch narrower than the width of the boards and one-quarter of an inch shorter than their height.

The lining piece for the backbone of a portfolio is glued and put in place first Then the pieces for each side are glued and placed just short of the back edges of the boards They overlap the lining extending over the back If the lining is put down in three pieces, instead of in one piece, the material is easier to handle and is likely to be smoother over the hinge.

If ties are to be put on a portfolio, holes are made with a knife through the boards from the outside after the cover material has been glued on and before the portfolio is lined. Through these holes tapes are usually inserted, and the ends are pasted down on the inside of the boards.

Glue is used, instead of paste, for all lining up in portfolio work, because it warps the boards less than paste But its use necessitates rapid work, for it dries quickly, and a piece of material must be put in place at once after it has been glued.

When a portfolio is finished, it should be left flat on a table and weighted until it is thoroughly dry If any difficulty is experienced in getting either the covering or the lining material smooth after gluing, the portfolio is put in the press, one board at

a time, and is pressed heavily just after the material is glued onto it. It is left in the press only for a few minutes, because if it is left longer the glue is likely to strike through the material.

CHAPTER XIX

MISCELLANEA

Slipcases Solander Cases Chemises

SLIPCASES

TO make a slipcase, sometimes called a "thumb case," for an octavo book, a Number 30 cloth board is used for the sides, and the end- and backstrips For a very small book, a thinner board may be used for the strips

First, the two end strips and a backstrip are cut in width To take the measure for the width of these strips, if a paper lining is to be used, the bound book is laid flat on the workbench, a straightedge is placed across the length of the book and let to extend over the ends of it, and the difference in thickness between the middle and the ends of the book is noted. The measure of the thickness of the book in the middle of the page, plus a very slight addition, will be the correct measure for the width of the strips. This is usually about a generous thirty-second of an inch larger than the thickness of the book at head or tail A "proof strip" is then cut to this width. It should be tested for width by standing it along the back of the book. When one edge of a straightedge is lightly held down across the book from the fore-edge over the strip which lies against the back, if the strip can be drawn out from under the straightedge easily, it is the proper width. If it draws out with difficulty, it is too wide, if there is a gap between it and the straightedge it is too narrow When the correct measure is found, the three strips are cut for width.

Next, two boards for the sides are squared to size. The length of the boards should be the length of the book, plus the thickness of the two end strips, plus one-eighth of an inch The width should be the thickness of the backstrip, plus the width of the book cover from the fore-edge to the joint of the cover After cut-

ting the length of these boards, the cutting-machine gauge should be left unchanged until after the length of the backstrip is cut, as this strip should be the exact length of the side boards.

The length of the backstrip is now cut It is first squared off at one end and then cut in the machine to the size already set Then the length of the two end strips is cut. To find this measure most accurately the backstrip is stood up on a side board with one long edge resting even with the edge of the length of the board so that the side of the backstrip lines up evenly with the board edge One of the end strips is laid flat across the width of the board and at one end of it so that it touches the backstrip. The projecting end of the strip is then marked on a line with the front edge of the board If the case is to be lined with a heavier material than paper, all these measurements must be augmented to allow for the extra thickness of the material.

The boards for the sides and the strips for the ends and back are now lined up. The lining material is usually paper, Canton flannel, chamois, or split skin When the material has been cut a little larger all round than the boards and strips to be lined, each strip or board is glued, one at a time, placed on the lining material, rubbed down thoroughly, and then put in a press between covered tins. It is left for about fifteen minutes After being taken out of the press, the overhanging material should be cut off on a tin with a knife It must be cut even with the edges of the strips and boards

If the case to be made is for a square-back book, the two side boards must now be cut out on the edges that will come on the front of the case. The book may then be conveniently pulled out of the case The usual way of cutting the boards is shown in Fig. 144 A. In this model a thumb-shaped half-circle is cut out—hence the name "thumb case" A model which I think more convenient to use and which results in a more pleasing form is shown in Fig. 144 B. In both instances a pattern is cut out of paper, placed on

the board, and marked on it before cutting The cutting is done on a tin with a sharp-pointed knife.

After the side boards are cut out they are beveled along the front edges To bevel them, they are placed one at a time on the workbench. A sandpaper block is then used over the edges to

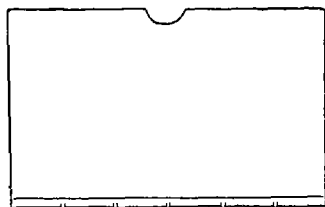



Fig 144 A.

thin them down to about half their original thickness. When Model 144 B is used for the cutouts, the board is thinned only to points C and D. On Model 144 A they are beveled almost up to each end, and must be beveled to an even thickness.

Unless used at once, the lined sides and strips should be kept

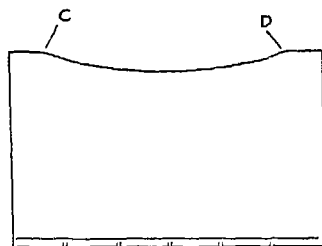



Fig 144 B

in the press, but it is better to use them as soon as they are lined, for then warping has not begun and they are consequently easier to use.

To make the case, one side board is placed flat on the bench, and one long edge of the back board is glued with heavy glue The work must be done quickly, and a generous amount of glue

should be used, though it should not be allowed to run over onto the sides of the strip. When glued, the strip is placed on the back of the board so that its side lines up with the edge of the board and its ends coincide with the ends of the board The strip is pressed down and held in place firmly for a minute or two The flat side of a folder is used to adjust the strip to line with the edge of the board The end strips are then glued, one at a time, on one long edge and on one short edge They are put down along the width of the board even with the board edge and with the short glued ends pressed tightly up against the backstrip. Each strip is held in place until it is firmly stuck. If cut correctly, these end strips, after being glued down, will be even with the front of the board.

When the strips have been glued down, the half-made case is held in the left hand and all the exposed edges are quickly and carefully glued The case is then laid on the bench, and the second side is put in place over the glued strips so that its edges are on a line with the sides of the strips. After the second side has been lined up accurately, a board is laid at once on top of the case without disturbing it, and a heavy weight is placed on the board.

The backstrip always reaches the full length of the case and the end strips are glued so that they rest against it. This makes for greater strength than if the side strips overlap the back board, and it also does away with a pieced board on the back at head and tail.

When the glue has "set," the edges of the case are sandpapered off with a sandpaper block until they form an even surface. The case is then bound on the three solid edges with a piece of wrapping paper. The paper is cut into three pieces, each a little wider and a little longer than the edge to be bound. One at a time the pieces are glued, put on the edges of the case, and rubbed down firmly. After each piece is affixed to an end, the case is stood up on a tin, and with a knife the overlapping edges of the paper are

trimmed off all around, even with the edges of the boards These strips strengthen the box, since they overlap the joining of the boards.

If the slipcase is to have a flat back, the covering material is now cut out. If the back is to be round, a rounded piece of wood is cut to size and is glued on the back A binder should keep on hand strips of wood rounded on one side and flat on the other. These strips are of assorted widths and different degrees of roundness, and they have to be milled to order from patterns supplied by the binder. They should range from about one-half inch to two inches wide so that a case of any width may be fitted with them.

A wooden strip which is nearest in width to the width of the case should be chosen It is cut square at each end to the exact measure of the length of the back of the case. Then it is glued up on its flat side with a light coating of thinnish glue and let to dry. When dry, it is given a coat of rather heavy glue, is put in place on the case, and is pressed down firmly with the hands until the glue is set. The wooden back is rarely the exact width of the back of the case, and after it has been fastened securely a carpenter's plane is run along its length until its edges are even with the sides of the case.

The rounded back may be left smooth, or if bands are desired, the back is compassed up for them and marked (see p. 110) A binder usually keeps on hand pieces of leather for faking bands on cases. They are made by pasting two strips of leather together. After being pasted to each other, they are nipped in the press and then kept under a weight till dry Paste is used instead of glue in this instance, so that narrow strips may be cut off from the leather without the danger of having the two layers peel apart. The doubled leather is laid on a tin, and strips for the bands are cut from it with a knife. They should be cut somewhat longer than enough to reach over the back, and they may be any

width desired. One by one they are glued and placed on the marks indicated for the bands on the back of the case. After they are firmly fastened to the back they are cut off even with the sides of the case The edges should be sloped so that they conform to the contour of the back.

When a round back is put on a case in this way, the joinings at the head and tail and on the sides cannot be perfect, and these joinings are filled in with cord cuttings and paste so that they may not be evident after the case is covered. The filling in is done as for backs and headbands (see p 175).

Both the square-back and round-back cases are now ready to be covered. Slipcases may be covered in a variety of materials — in full cloth, in full leather, in half leather with cloth or paper sides, and in half cloth with paper sides. A case covered in full or half cloth may not have bands on the back, though it may have a round back.

FULL CLOTH CASES When cases are covered in full cloth, a piece of cloth is cut long enough to reach from the front of one side of the case to the front of the opposite side, plus about three-quarters of an inch for turnovers The width of the cloth should be equal to the whole length of the case, plus about three-eighths of an inch for turnovers. The cloth is cut so that its length runs with the selvage. It is then marked off on the underside along its length at a distance of three-sixteenths of an inch from the edge. Along its width, a line is marked three-eighths of an inch back from the edge (see Fig 145 A). One side and the back of the case are then glued with thin glue, and the side is put down on the cloth with one corner of the front of the side placed exactly at the corner A formed by the two marked lines (see Fig. 145 B). The end and the front edge of the case should rest on the marked lines. The cloth is pulled up over the back, and both the back and side are immediately rubbed down with a folder until the cloth

is securely fastened to them. Then the second side of the case is glued, after which the cloth is pulled tightly over it and is rubbed down. When the back is being glued, the glue should be allowed to extend a trifle over the unglued side of the case.

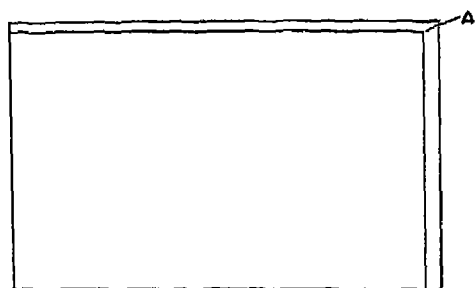



Fig 145 A.

The cloth protruding beyond the edges of the back at head and tail is then snipped at intervals to allow it to turn over smoothly. One at a time, the turnovers are pasted, are turned over the edges, and are pressed firmly in place with a folder. The corners of the

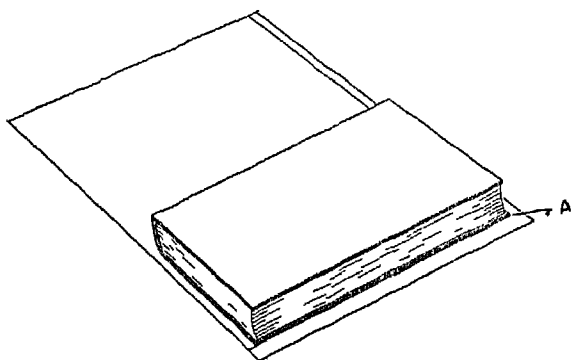



Fig. 145 B

cloth on the sides of the case are cut off diagonally, leaving a liberal overhang. Each of the turnovers on the boards at head and tail of the case is pasted and then turned over the edge and rubbed

down. The turnovers on the front edges of the box are cut to follow the curved edges and are snipped at intervals along the curve. They are then separately pasted, turned over onto the inside of the case, and smoothed flat with a folder At the corners the cloth is tucked around on the inside of the case so that it extends over the head and tail boards. In order to be turned over the front of the case smoothly, the turn-ins must be snipped frequently along their curved edges The deeper the curve, the more frequently the snipping must be done.

Finally, two pieces of cloth are cut for the head and tail of the case. First, the strips are cut the exact width of the head and tail. One end of each strip is squared or rounded to the contour of the end of the back, if the back is round, and then the two strips are cut about three-eighths of an inch longer than the width of the case. Each strip is glued with thin glue and is put in place on one end of the case up to the edge of the back Then the overhanging piece of cloth is turned over the front edge onto the inside of the case and is thoroughly rubbed down Because the front edge turnovers have to be snipped, the finish on the inside of the case is not neat; therefore a continuous strip of cloth is pasted over the snipped cloth. To cut the strip the case is laid on the underside of a piece of cloth, and the shape of the front edges of the case is marked on the cloth The cloth is cut with the shears on the line marked for each side, and it is cut into strips the length of the inside of the case and the width of the snipped, turned-over edges. After being pasted and put in place, it should be firmly rubbed down.

If a cloth-covered book has a round back, the front edges of the case need not be cut out. The width of the case should be somewhat less when the case is not cut out, if it is to be placed on the shelf with its back exposed. It should then be of a width which will allow the book to be grasped by the joint when it is being

pulled out of the case. Therefore the case should come not farther than the back edge of the bookboard, thus leaving the full joint exposed.

A flat-back case covered with cloth may be lettered directly on the cloth, but a "title piece," or leather label, pasted on the back of a book enhances its appearance. The label should be paste-washed before titling, and after titling, it should be varnished with a thin binder's varnish.

FULL LEATHER CASES. Full leather cases usually have rounded backs which bear the title of the book In this instance the front of the case is cut out as shown in Fig. 144 A or 144 B A full leather case implies that it contains a book of value, hence, in order to protect the back, a "chemise," or cover, is made for it before the case is made (see p 294). The book must be covered with its chemise when the size of the case is being calculated.

The leather for the case is cut like the material for a full cloth case, but with a narrower margin allowed for the turnovers. It is pared like the leather for a limp binding (see p 259) Except for the matter of the covering strips on the head and tail of the case, the same technique as that for making a full cloth case is used in making, covering, lining, and finishing.

The edges of the leather for these end strips should be pared to a featheredge wherever they meet the edges on the top and bottom of the case. Where the leather turns over onto the inside it should be pared like all other turnovers After the leather has been turned over the edges at head and tail, the turnovers should be trimmed evenly all round with a knife and should be left not more than one-eighth of an inch wide. Then two pieces of thick paper or newsboard are cut to fill in the depressions left in the centers of the ends of the case These pieces should be of a thickness equal to the thickness of the cut edges of the turnovers, and they should be cut to fit up close to them and to extend from the

back leather turnovers to the front edges of the case. They are put in place with paste.

The pared leather strips are now separately pasted, and each is rubbed down on an end of the case. Paste, and not glue, is used on the leather strips so that they may be slightly stretched, if necessary, to meet the edges of the case perfectly. The case is finished on the inside with pieces of thinly pared leather, which are cut to the shape of the front of the case and are then pasted in place and rubbed down

HALF LEATHER CASES WITH CLOTH OR PAPER SIDES. Cases may be covered in half leather with either cloth or paper sides They are constructed exactly like a full leather case. The back is usually round and may or may not have bands. The boards on the inside of the case are lined. The front edges of the case may be either cut out, as in Figs. 144 A and 144 B, or left straight. If left straight, the boards are measured as for a full cloth case with straight front edges Whether straight or cut out, they are thinned at the front edges with a sandpaper block, as are all slipcases, however fashioned or covered

The leather is cut like that for the back of a half leather binding (see p 188), except that only one-quarter of an inch is allowed for turnovers. The turnovers are pared very thin, and no other paring is done on the leather other than beveling the edges on the sides, as for a half binding. After having been pared, the leather is pasted and is worked over the back and rubbed down. The back turnovers are then snipped and turned as for a full leather case, and the remaining turnovers are put in place. The case is set aside for an hour to dry, and then the leather on the sides is cut (see p 246). The ends of the case are covered partly with leather and partly with paper. The leather extends the same distance over the ends of the case as over the sides, and the paper lines up with the paper on the sides

Two pieces of leather are cut for the two ends. Each piece should be cut somewhat wider than the ends and a little longer than enough to extend beyond the line of the back and beyond the end of the leather turnovers on the end of the book. Each piece is pared at the back edge and on the side edges like that for a full leather case. On the front edge it is beveled off like the leather on the sides of the case. After being pared, each leather strip is cut to size, pasted, put in place, and adjusted with a folder to fit the edges of the case. When both strips have been fastened to the case they are left to dry and are then cut off on a line with the edges of the leather on the sides of the case.

The sides and ends of the case are filled in up to the leather. The material used for the filling in is usually newsboard It must be the same thickness as the trimmed-leather edges The pieces of filling-in material are cut a little larger all round than the spaces to be filled, with a clean, straight edge left on the sides which are to be next the leather. Each end piece is glued and rubbed in place. After a strip is affixed to the end, the case is rested on a tin, end down, and the overhanging edges of the material are cut with a knife even with the edges of the case In like manner the side filling-in material is glued to the case and cut off.

Now the papers are cut for the sides. They should be one-half inch longer and three-quarters of an inch wider than the sides. Each is glued with very thin glue and is placed on the case with one long, straight edge overlapping the leather (see p 251). It is then immediately rubbed down, and the side is finished like the side of a full cloth case. When both sides are finished, two end pieces are cut from material like that used on the sides. Their width should be the exact width of the end of the case. They should be long enough to reach just over the leather on a line with the side material and to turn over the front edge of the case, leaving about a quarter of an inch on the inside of the case The inside of the case is finished like a full cloth or full leather case.

Half Cloth Cases. A case with half cloth back and paper sides, with or without a round back or cutout front edges, is usually made like the half leather cases just described.

Books that are not rare or of great value except only to the owner are not infrequently cased in half cloth and put in slipcases. By changing the manner of covering, a very trig cloth and paper case may be made, which is especially suitable for a thin book cased with a cloth back and paper sides (see Fig. 146).

We will suppose that a slipcase is to be made for a thin book of this sort that has been cased with a black cloth back and plain

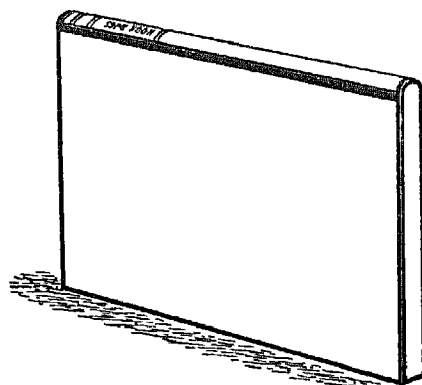



Fig 146

écru paper sides A plain paper soils easily, and either a chemise or a case should be made for a book covered with it, unless the paper is sized after the case is made.

A case for this book that will have special appeal is made with a flat back and front edges which are left straight. The front edges should be thinned down with a file or sandpaper block more than for a case with cutout edges. Its sides should be the same width as the boards of the book and should not be made to cover the joint of the book This is in order that the book may be pulled from the case by taking hold of it over the joint (see Fig. 146).

The case having been made, a piece of black binder's cloth is cut one-half inch wider than the thickness of the case and long enough to extend in one continuous piece from the front of the case over the top, down the back, and then across the bottom of the case, with an additional one and one-half inches added for

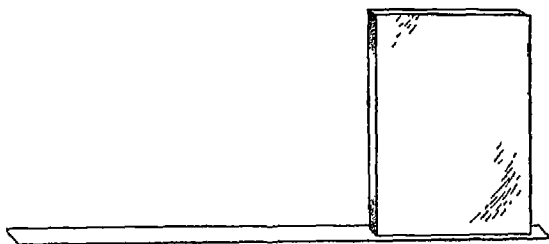



Fig 147 A.

turnovers The strip should be cut with its length running parallel to the selvage of the cloth, in order that the cloth may be turned over the edge with the grain.

The back of the cloth strip is then marked with a pencil. One line is drawn one-quarter of an inch from one edge along the

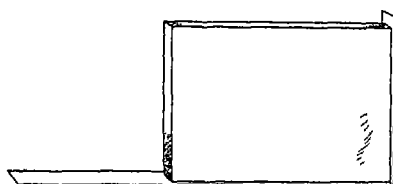



Fig 147 B

whole length of the strip, and a second line is drawn across one end of the strip three-quarters of an inch from the edge. Then one end of the case is glued with thin glue. It is put down on the cloth strip with the front of the case on the line marked across the cloth and with one edge on the line running along the length of the cloth (see Fig. 147 A) The glued-down cloth is rubbed

thoroughly with a folder. The back of the case is now glued and is put in place on the line and rubbed down (Fig. 147 B). Finally, the second end of the case is glued, and the cloth is pulled over it tightly and rubbed down (Fig. 147 C). All the gluing should be done with the case held in the left hand. The glue must be thinly

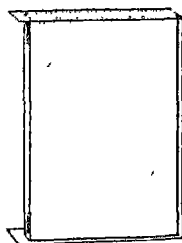



Fig 147 C.

and evenly spread and must extend to the very edges of the case.

The overhanging cloth is creased over the side of the case at each corner and is pinched up so as to form a fold that runs diagonally to the corner (see Fig 148 A). Held in this position with the left hand, the cloth is cut off with a pair of shears, on lines running about a thirty-second of an inch above the side of

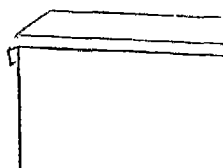
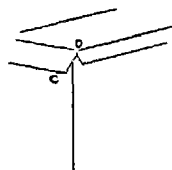



Fig 148 A Fig 148 B

the case (see Fig. 148 B). The cutting must stop just short of the corners of the case. This cutting miters the cloth at the corner so that it may be turned over smoothly. The pieces of cloth overhanging the front edges on the two ends of the case are cut off diagonally about a quarter of an inch from the corner (Fig 148 B

— corner C-D). All the turnovers are then ready to be put in place. Each one is pasted, is folded over the side of the case, and is smoothed with a folder until the edge is left sharply defined The overhanging cloth at the front is pasted and turned over onto the inside of the case.

Two straight strips of the black cloth are now cut to bind the front edges of the case Each should be as long as the length of the

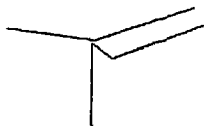



Fig. 149

case and wide enough to cover the edge and turn over one-quarter of an inch inside and outside of the case.

The cloth turnovers pasted down on the side of the case are cut off on the four front corners so that the front binding strips may be mitered over these strips at the corners (see Fig. 149). It should be noted in consulting Fig. 149 that the diagonal cut is made from a point beyond the corner on the front edge. This is so that

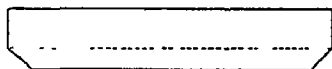



Fig. 150

the corner will remain well covered by the cloth, which will be overlapped by the front strip.

The two strips cut for the front binding are cut off on an angle, as shown in Fig. 150, and a line is drawn along each side of the case one-quarter of an inch back from the front edge Each strip is then glued, and the mitered edge is placed on the line drawn along the front of the case. It is quickly rubbed into place with the hand, and then the strip is turned over the edge and onto the

inside of the case. Glue is used instead of paste, because material loses none of its stiffness when glued, as it does when pasted, and when stiff it is easier to place.

All turning of edges should be done first with the hand. Then the material should be pulled over tightly and smoothed out with a folder so that the edges are left sharply defined.

The case is now quickly finished by cutting out pieces of the écru paper to cover the sides and ends and then gluing them and putting them in place. Each piece of paper is cut one-eighth of an inch short of all four edges of the case. This allows the black edging to show all round. The book does not have a chemise, as it would interfere with being able to take hold of the book at the joint when removing it from the case. It is lettered on the spine, which is placed outward on the shelf.

SOLANDER CASES

A solander case is one into which a book is put from one end, and not slipped in from the side as when put into a slipcase. Unlike a slipcase, it is cut into two parts, one part of which serves as a cover. The cover, or top, of the case slides over a collar attached to the bottom (see Fig. 151).

The material used for making the body of the case is a hard-finished, thin board, similar to a newsboard. The lining material may be of Canton flannel, chamois, cloth, or paper, though flannel or chamois is preferable. The covering material should be of leather, preferably levant- or turkey-morocco.

Some binders make a form out of binder's board with a round wooden back to serve as a model over which to construct the case. However, this is quite a bit of work, for the form must be absolutely square and must be an exact replica of the book in size and shape. Instead of using a made form, the book itself may be used. Before it is employed for this purpose, it is covered by wrapping a piece of stout, thickish paper around it and tipping one edge of

the paper down with paste so that it overlaps the other edge on the fore-edge of the book

The collar, over which the top of the box slips, is made first. For this, a strip of lining material and a strip of the thin board are cut the same size. These should be cut so that they will reach around the form with about one-quarter of an inch overlap

Fig. 151

Their width should be about one-quarter of an inch less than the full height of the book. Then each end of the lining material is glued on opposite sides, to a distance one-quarter of an inch back from the ends It is drawn tightly around the form with one long edge even with the bottom of the book, and one glued end is rubbed in place over the other glued end. The lap should come on one side of the form. The board is then glued in the same way and is placed around the form over the lining with its edges over-

lapping at the fore-edge The edge of the overlap is sandpapered off somewhat to reduce its thickness.

Now a strip of board is cut for the fore-edge the length of the width of the lining. In width it is cut the width of the fore-edge The strip is glued and rubbed down over the fore-edge, and the fore-edge is placed on the bench and is squared up with the folder. If the strip projects beyond the sides, the edges are sandpapered off. A sandpaper block is also run lightly over the top edge of the box to take off its squareness, so that the collar of the case will look less clumsy after being covered This completes the construction of the inside collar which partially lines the case, and the collar must now be covered with leather.

The leather may be of a contrasting color to that to be used on the outside of the case. For a small book it is cut about one-quarter of an inch wider than the height of the box just made and a little short of long enough to reach completely round the box. (This short cutting is to allow for stretching) If the box is octavo size or larger, the leather may be cut only wide enough to cover the collar well, and the bottom of the box is then filled in up to the leather with newsboard. But great care must be taken to choose a filling-in board of just the right thickness, for otherwise the joining will show on the outside of the case.

Before the leather is pared, a line is marked one-quarter of an inch back from one edge along its length, and another line is marked one-eighth of an inch wide back from each end of the leather. One long side is pared quite thin, from the marked edge out. Each of the two end edges is pared on an even slant from the marked line out to a featheredge, so that they will form a smooth joining The second long side is not pared. After the leather is pared, a line is again marked along the length of the leather to indicate where the paring for the turnover begins.

The leather should join on one edge of the fore-edge, and when it is being put on the inside box just made, the box must be

kept in place over the book. After the leather has been pared, it is first sponged on the outside with water and then pasted thoroughly One end is placed just over the fore-edge, and the leather is worked on over the box while the mark denoting the pared line is kept even with the top of the collar. The leather is then mitered neatly at the corner of the fore-edge, and the turnovers are re-pasted if necessary and turned over the edge of the collar.

When the covered box, or collar, has dried for a few minutes, it should be removed from the form and then put back on the form from the opposite end. This is to smooth down the turn-ins

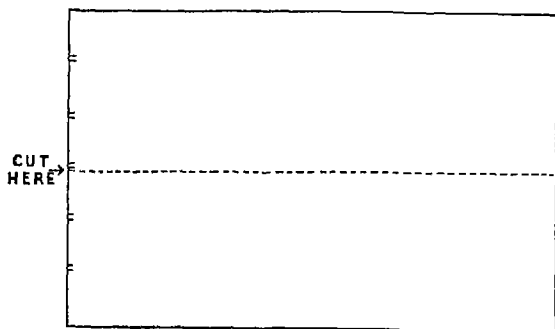



Fig 152

and to be sure they are securely stuck. The inside of the case is now completed.

To make the outside part of the case, two pieces of the thin board are cut about one-quarter inch wider than the height of the whole form, or book, and a little longer than enough to go around the two sides, and the back, and project beyond the edges of the sides of the box just made. Then a strip of lining material is cut the same size. The strip of board is now compassed up and marked on one edge for five bands (see Fig. 152) It is cut in two between the second and third bands, as shown by the dotted line in Fig. 152 The lining material is likewise cut into two parts.

The covered box is left on the form, and the whole form is covered with a piece of wrapping paper, which is put on tightly and joined with glue. The paper should be cut the exact height of the covered form and should be cut only long enough to make a small overlap. Each piece of lining material is glued at the ends on opposite sides, is put around the form right side down against the wrapping paper, drawn evenly tight, and then joined at the center of one side of the form.

To cover the fore-edge of the built-up form, a strip of board is now cut from a piece of heavy newsboard It is cut the length of the two side boards that were compassed up for the bands. The width is found by placing the covered form flat on the bench, laying a straightedge flat across its width below the collar, and then measuring the distance between the underside of the straightedge and the top of the bench. While the dividers are set to this measure, a strip should be cut the same width and it should be long enough to cover both the top and bottom of the case, with something over This strip will later be cut for length. The strip which will serve for the two ends of the case is lined with the lining material, and the overhanging edges are trimmed close to the strip all round.

One of the wider-cut strips of newsboard to go on the lower part of the case is glued and is then placed down over the lining on the sides and back of the form After the first strip has been thoroughly rubbed down, the second wide strip is glued, placed over the first one, and rubbed down The edges of both strips will project beyond the form at the front edge. The longer fore-edge strip is glued and is put in place over the lining between the two projecting side strips. After this strip has been firmly pressed down, the projecting edges of the sides are trimmed off even with the face of the front strip, and they are sandpapered down

Now the top part of the case is made in like manner First the lining is placed and secured around the form, then the board

strips are glued around the lining, the fore-edge strip is added, and the top of the case is finished like the bottom In setting the fore-edge strip, the top should be put over the bottom part of the case and the two fore-edges are lined up together. A piece of unprinted newspaper is then glued over the fore-edge strip of the top and bottom of the case and lapped over onto each side of the case for about a sixteenth part of an inch. This is to keep the strips evenly lined up and securely fastened. When a large case is being made, a thin cambric is used instead of the unprinted newspaper If necessary for strength, a second piece of board is glued on the fore-edge over the first strip. It is made to extend over the edges of the side boards and is cut off flush with them. This second strip should be lined up with paper or cambric The strips lined up for the top and bottom of the case are now cut to length. The dimensions of each strip must be separately calculated and the strips are marked "top" or "bottom" after being cut. A trial-and-error method is followed in getting these measures, for the pieces are cut to fit inside the case. The strips have already been correctly cut for width. To cut the strip for length, it is first squared on one end, then the box is stood up, and the strip is placed inside the downward end of it. The squared end of the strip is pushed up against the squared end on the inside of the box. In this position, the curve of the back of the box is drawn on the end of the strip, and the strip is cut inside this line How far it should be cut inside the line may be judged by observing the thickness of the case at the back. A little extra trimming usually has to be done in order to get a perfect fit. The strip should be tested by putting it in place inside the case from the bottom. It is then marked for the end for which it was cut, and the second strip is cut

One extra strip is glued on the top and the bottom of the case. Extra heavy newsboard is used for these strips. Two pieces are cut out a little larger all round than the top and bottom of the case. One of the strips is glued on one side, and the case is placed down

on it; all the edges of one of the inside strips are carefully tipped with glue, and the strip is put down, lined side upward, from the inside of the case onto the outside strip just glued on. It is pressed down and adjusted from the inside with a folder. When putting the inside strip in place it should be held with the edges on its length bent downward, and it should be tilted in width until it reaches the bottom of the case Otherwise, its glued edges will smear the lining. After the inside strip has been worked in place, the outside strip is cut off flush with the edges of the case. The other end strips are glued on and are cut in the same way, and the cover is put in place The edges of the top and bottom are finished off with a sandpaper block. The edges of the upper and lower part of the case are then sandpapered until they meet and fit perfectly.

The body of the case is now completed except for having false bands put on the back, if bands are desired When this is to be done, the back is compassed up and marked so that three bands go on the upper part of the case and two bands on the lower part. The last band on the cover is put on the extreme edge of the case and is made to line up with the edge.

Then several long strips are cut for bands out of a thin, stiff board The width depends upon the taste of the forwarder. From one of these strips a piece is cut long enough to project slightly on both sides over the back. This piece is glued, put in place on one of the marked lines, and rubbed down until it adheres firmly to the back Another piece is cut, glued, placed on top of the first one, and rubbed firmly in place If a high band is wanted, a third strip may be added When all the bandstrips have been put in place, the case is laid on the edge of the bench with its back extending beyond the bench, so that the ends of the bands will not be disturbed It is left to dry a few minutes, after which the ends are cut off. To cut them, the case is kept on its side with its bands off the bench, and each band is cut off with a sharp knife, on a

slant which slopes from the back to the edge of the side boards of the case. The case is then ready to be covered.

The leather is cut, pared, and put on the top part of the case as for a full leather slipcase, except that the side leather is turned over onto the front edge of the case Hence a strip must be cut for the fore-edge, as for the ends of the case The same is true of the bottom part of the case, but since the leather stops at the collar, it is pared to a paper thinness on the edge that joins the bottom of the collar. The leather at this point, when being put in place, must be moulded over the edge so that it melds with the leather of the collar.

A book that has a solander case should be covered with a chemise if the leather is delicate, and the chemise should be made and put on the book before the case is made.

After learning to construct a slip cover, and a solander case, one should be able to make any kind of case for a book. A flat case with a hinged cover is constructed of binder's board in a way similar to that used for making slipcases. The cover is hinged to the case with a leather hinge which is put on in the same way it is put on a book.

CHEMISES

Before a case is made for a book, a "chemise," or cover, should be made for it if it is bound in full leather and is elaborately tooled. A chemise should also be made for a valuable first edition when it is "boxed," however it may be covered, and one must always be made for a scarce item that is to be left in its paper cover or one which is in bad condition This kind of loose protective covering is invaluable for preventing the covers of books from being worn.

There are several types of chemises The simplest type is one made like a casing and then lined on the inside. It may have edges that hinge over the fore-edge of the book, or all its edges

may extend an infinitesimal amount beyond all the edges of the book cover.

A heavy quality of newsboard is used for the cover boards, and if the chemise is to turn over the fore-edges of the book, two narrow pieces of newsboard are cut out the length of the cover boards A strip of newsboard is cut for the back if the back of the book is flat If it is round, the strip should be cut from redboard. All these boards are cut just long enough to cover the book generously.

Leather, cloth, or any other woven material may be used for

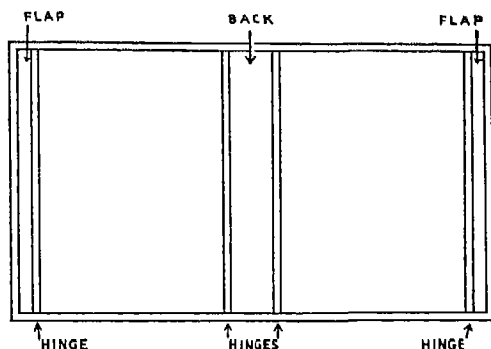



Fig. 153.

covering the chemise. The material is cut out and marked up as for a casing (see p 268), with an added mark at the fore-edge when the fore-edge is to be covered. In making the chemise, each board should be glued and put in place as when making a casing. When the fore-edge is covered, the hinges at the fore-edge should be about one-sixteenth of an inch wide, so that the fore-edge flaps may be turned over sharply (see Fig. 153).

After the covering material is turned over onto the inside of the cover, a lining of any chosen material is glued over the inside of the chemise, as for a portfolio (see p. 270). The chemise is left flat to dry under one or two lithographic blocks When dry, it is

creased along the hinges and fitted to the book. When a chemise is made for a round-back book, the back of the chemise must be shaped to the back of the book, like a round-back casing (see p. 269).

CHAPTER XX

MISCELLANEA

Repairing old bindings Cleaning, sizing, washing, and toning papers. Binders' tricks

REPAIRING OLD BINDINGS

A BOOK that comes to the binder with the covers split at the joint and the sewing threads broken should be pulled and rebound, if it has a tight back. However, when the owner insists upon having the old covers retained, the book must be cased, not bound, for the cords cannot be laced through the old covers In this instance, the covers are removed and repaired if necessary, and the book is taken through the processes of mending, sewing, backing, headbanding, and lining up, as for a casing (see p 266). It is then pasted into its covers like a cased book, though it is seldom possible to case a book in the covers in which it was once bound and still have an ample "square" at the fore-edge. A better method of dealing with the book is to remove the covers and rebind the book in a leather as nearly as possible like that on the original binding. When this is done, the covering material is removed from the boards, the lining is scraped off the leather back, and the old sides and back are pasted down over the sides and back of the new binding This method of restoring a binding can often be used so that almost none of the new leather shows, and that can be tinted to match the old leather. But when the old leather is disintegrated, this cannot be done, and there is no alternative to rebinding and redecorating the book

When a leather-covered book with a hollow back has its covers split off along the joints, it can be repaired and retain both the old back and old covers, though the work takes much time, patience, and ingenuity The back covering is first removed from the book, and the lining is moistened and taken off the leather This must

be done with care When the bare leather has been reached it is smoothed off with a piece of fine sandpaper. Then some matching leather is sought for. If it cannot be found, a near-matching color may be toned with a dye wash If the color is a dark tan, a lighter tan may be darkened with coffee or with a permanganate of potash solution (see p. 304).

The leather is cut into two strips, each a little longer than the book and wide enough to extend a quarter of an inch under the back leather over the joints, and about one-quarter of an inch under the leather on the sides It is pared to a suitable thickness all over and then thinned down quite thin where it goes under the back and side leather. The pieces of leather are pasted on the upper side to a depth of one-quarter of an inch, and one is affixed to the underpart of each side of the back A piece of thin newsboard is cut just short of the width of the leather back and one-quarter of an inch shorter than its length It is then glued down on the leather back; and a piece of fine cambric, cut the same length and wide enough to reach about one-half inch over each side of the book, is glued down over the newsboard It is cut off on the sides at an angle (see p. 258) A piece of strong wrapping paper is then glued over the cambric.

The edges of the leather on one side of the book are carefully lifted with a thin folder or a dull knife. The back is put in place on the book, with care taken to see that the title is right side up, and the extension of thinly pared leather coming from under the back is marked for width It must lap about a quarter of an inch over the board The back is removed from the book, and the strip is cut off evenly and pared to a featheredge. It is then pasted on the underside, the back is put in place again, and the pasted strip is carefully tucked under the lifted leather and rubbed with the folder until it adheres to the book cover. The lifted leather is pasted on the underside, is put down in place, and with a paper over it, is rubbed down firmly

The book, with its cover in place, should be weighted over the hinge and left undisturbed for at least a half hour Then the other side is fastened to the cover in the same way, and the book is put aside under a heavy weight until it is dry. The leather should not be moistened with water, for fear of staining and darkening it.

When the cover is dry, it is removed from the book A folded end paper is tipped along the edge up to the joint on each side of the book and is cut even with the edges of the text A piece of fine cambric is cut and glued over the back of the book, with about one-half inch extending over each side. On top of the cambric a heavy paper is glued and rubbed down thoroughly, especially over the joints (see p. 177). If the book needs new headbands, they are worked on before the cambric is put on the back.

The book is now ready to be fastened into its covers It is placed well up in the covers and held tightly in this position while it is being laid on the bench. Boards are built up to a height equal to the thickness of the book and are placed against the back. The top board of the book is opened and is let to fall back on the built-up boards Then a piece of wastepaper is put under the cambric strip, which is cut off so that it does not extend beyond the edges of the text, and the cambric is glued lightly and is then rubbed down over the board like a leather hinge (see p 230) The book is turned over without disturbing the position of the opened boards, the built-up boards are placed on top of the opened cover; and the closed cover is opened, and let to fall back over the pile of boards With the book in this position, the second piece of overhanging cambric is glued down over the top board. A thin board is put under the text, the built-up boards are pulled out and removed, and a thick wad of paper is put between the covers to hold the upper one on a line with the book pages. (See directions for pasting back end papers, p 224) The book is left for a half hour, and then the two end papers are cut and pasted back as de-

be done with care. When the bare leather has been reached it is smoothed off with a piece of fine sandpaper. Then some matching leather is sought for. If it cannot be found, a near-matching color may be toned with a dye wash If the color is a dark tan, a lighter tan may be darkened with coffee or with a permanganate of potash solution (see p 304).

The leather is cut into two strips, each a little longer than the book and wide enough to extend a quarter of an inch under the back leather over the joints, and about one-quarter of an inch under the leather on the sides. It is pared to a suitable thickness all over and then thinned down quite thin where it goes under the back and side leather The pieces of leather are pasted on the upper side to a depth of one-quarter of an inch, and one is affixed to the underpart of each side of the back A piece of thin newsboard is cut just short of the width of the leather back and one-quarter of an inch shorter than its length It is then glued down on the leather back, and a piece of fine cambric, cut the same length and wide enough to reach about one-half inch over each side of the book, is glued down over the newsboard. It is cut off on the sides at an angle (see p 258) A piece of strong wrapping paper is then glued over the cambric.

The edges of the leather on one side of the book are carefully lifted with a thin folder or a dull knife. The back is put in place on the book, with care taken to see that the title is right side up, and the extension of thinly pared leather coming from under the back is marked for width It must lap about a quarter of an inch over the board The back is removed from the book, and the strip is cut off evenly and pared to a featheredge It is then pasted on the underside, the back is put in place again, and the pasted strip is carefully tucked under the lifted leather and rubbed with the folder until it adheres to the book cover. The lifted leather is pasted on the underside, is put down in place, and with a paper over it, is rubbed down firmly.

The book, with its cover in place, should be weighted over the hinge and left undisturbed for at least a half hour. Then the other side is fastened to the cover in the same way, and the book is put aside under a heavy weight until it is dry. The leather should not be moistened with water, for fear of staining and darkening it.

When the cover is dry, it is removed from the book. A folded end paper is tipped along the edge up to the joint on each side of the book and is cut even with the edges of the text. A piece of fine cambric is cut and glued over the back of the book, with about one-half inch extending over each side. On top of the cambric a heavy paper is glued and rubbed down thoroughly, especially over the joints (see p. 177). If the book needs new headbands, they are worked on before the cambric is put on the back.

The book is now ready to be fastened into its covers. It is placed well up in the covers and held tightly in this position while it is being laid on the bench. Boards are built up to a height equal to the thickness of the book and are placed against the back. The top board of the book is opened and is let to fall back on the built-up boards. Then a piece of wastepaper is put under the cambric strip, which is cut off so that it does not extend beyond the edges of the text, and the cambric is glued lightly and is then rubbed down over the board like a leather hinge (see p. 230). The book is turned over without disturbing the position of the opened boards; the built-up boards are placed on top of the opened cover; and the closed cover is opened, and let to fall back over the pile of boards. With the book in this position, the second piece of overhanging cambric is glued down over the top board. A thin board is put under the text, the built-up boards are pulled out and removed, and a thick wad of paper is put between the covers to hold the upper one on a line with the book pages. (See directions for pasting back end papers, p. 224.) The book is left for a half hour, and then the two end papers are cut and pasted back as de-

scribed on p. 225 After another half hour the book is closed and is put in the standing press (see p. 227).

CLEANING PAPER

The paper in old books often needs cleaning and resizing, but this can be done only by pulling the book apart, and unless an old book is very valuable, it would not be worth the time and trouble involved. Incunabula in original bindings should never be pulled apart, though if they have been rebound it is not a desecration to "pull" them, then wash and resize the text. Many stains can be removed by washing, and the surface of the spongy paper can be restored by sizing.

Printed books are often disfigured by pencil marks and other blemishes that can be removed without washing the sheets For this work a good pencil eraser, a piece of hard rubber or a typist's eraser, a little powdered pumice, and some sheets of the finest sandpaper are employed. First the pencil marks and smudges are treated by rubbing them with a soft eraser If the marks fail to respond to this treatment, the hard rubber or the typist's eraser is used on them. For inkstains, powdered pumice is taken up on a clean cotton tampon (see p. 340) and is rubbed over the ink trace, or the mark is rubbed over with a piece of fine sandpaper. When the paper is well sized, the inkstains will yield to this treatment, though when it is used on thin paper, care must be taken not to rub too hard. If the surface of the paper is soft, the ink will have penetrated so deeply that it cannot be removed in this way.

A grease stain, when it is fresh, can sometimes be removed by sprinkling powdered chalk over the spot, leaving it for half an hour, and then putting unprinted newspaper on each side of it and ironing the sheet with an iron sufficiently hot to draw the grease into the chalk For removing older grease stains a solvent is used The sheet is saturated with either gasoline or benzine, thin blotting paper is put on each side of it, and heat is applied

over the blotting paper as when using chalk for this purpose.

Nothing can be done with "art mat" paper, on which illustrations are often printed, for rubbing leaves a mark on its surface. Neither can it be treated by washing, since wetting destroys its surface and leaves a stain.

SIZING PAPER

The sheets of an old book may be sized when they have lost their original size and have become soft on the surface. Resizing will not only make paper stronger and restore its surface, but will tone down or remove any brown water stains

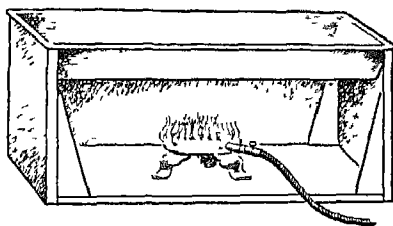



Fig 154

For sizing, a large low enamel pan similar to that used by a photographer is required As the size bath has to be used hot, the pan should be set into some sort of frame constructed so that room is left under it for an alcohol lamp or an installed gas jet (see Fig 154) Before sizing, the sheets should be dry-cleaned to remove any soil or pencil marks, for otherwise the size will "fix" them on the paper.

To make a size bath, an ounce of pure gelatin is soaked overnight in a little more than a quart of water. It is then slowly heated to a temperature of 120° F, at which temperature it should be kept while using Then it is strained off through a fine sieve made by tacking a piece of large-meshed gray super over a small frame. When the size is of a proper strength, a slight stick-

iness is felt between the fingers if they are dipped into it, if too sticky, more water is added. Size will keep several days, if covered

When the size is ready it is poured into the bath pan, under which a flame is kept while working One sheet at a time is laid into the hot size and is gently pushed down flat with the blunt end of a folder. Other sheets are laid on top of the first sheet, and they may all be taken out almost immediately unless water stains are to be removed, when they should be left for about ten or fifteen minutes If there are not more than a dozen sheets to be sized, they may be taken out of the pan, one by one, and placed between white blotting papers to dry. If the sheets are not dry in a day, the blotting paper should be changed. When an entire book is being sized, the sheets, as they are removed from the pan, are placed in a pile on a piece of clean, white paper After the pile is completed, a white paper is put on top of it, and the sheets are put in the standing press between pressing boards and wrung down until most of the water has been squeezed out of them. They can then be more easily handled, and each one is spread out to dry on a table covered with clean paper. When they are nearly dry they are hung over lines of cord, which are covered with paper, each sheet slightly overlapping the other. Then, in order to keep them clean, paper is put over them. In hanging them up, they are more easily handled if they are held over a long folding stick or a papermaker's peel (see Glossary)

If the paper is very fragile, one sheet is sized at a time, and this is laid on a sheet of celluloid when being put into the size. Care must be taken not to let the celluloid come in contact with the flame, for celluloid is inflammable As the size will not flow evenly over the underside of the sheet, the sheet should be turned. To turn it, another sheet of celluloid is placed on top of it, and the lower celluloid is removed. When taken out of the size, supported by the celluloid, the sheet is placed on a table A piece of

unprinted newspaper is put over it and is gently rubbed to absorb some of the moisture The sheet is then turned over with a fresh piece of "news" on it, the celluloid is removed, and the moisture is absorbed with another piece of unprinted news It is then turned over onto a piece of blotting paper to dry.

When the sheets are dry they should be mended, folded, and gathered into sections They are then pressed in the usual way, though with light pressure. Long and light pressing is necessary to flatten sections of hand-printed books, for heavy pressure will destroy the "punch" of the type.

WASHING PAPER

Many stains can be removed from paper by washing it in a bath of hot water with a little alum added, but inkstains and some other deep stains that cannot be removed in a size bath will need drastic treatment This means using some bleaching chemical, a process which usually results in injury to the fibers of the paper and should not be resorted to when handling valuable books. However, when deep stains are to be taken out of paper, a bath of permanganate of potash is used This turns the paper brown, and a sulphurous acid bath is then required to bleach the sheets white again Finally, a solution of hyposulphate of soda should be used to neutralize the acid.

To make the first solution to be used, an ounce of permanganate of potash crystals is dissolved in a little less than a full quart of water and are warmed to a tepid temperature The sheets of paper are put in this solution and are left for about two hours, or until they turn a deep brown They are then taken out of the solution and are washed in running water A purple color will run out of the sheets, and the washing should be continued until the water runs clear of color They are then put into a bath of sulphurous acid, which is made up by adding one pint of water to one ounce of acid. This bleaches the sheets white again, and they

should be left until the stains disappear. Only a few sheets at a time should be put into this solution, and the stains should be watched and the sheets taken out of the solution as soon as they disappear. Uusually this requires only a few seconds Then the sheets should be washed in clear, running water.

After coming out of the acid bath, the sheets are put into a bath of hyposulphate of soda. This is prepared by mixing one-half ounce of hyposulphate of soda to one-half gallon of water. This mixture is left until all the soda is dissolved. The sheets are soaked in the solution for about a half hour and are then put under running water for about an hour. Should any stains refuse to yield to this treatment, the process may be repeated. Sheets that have been put through this process must be sized. When it is necessary to do only a few sheets in a book, the sheets that have been freed of stains will have to be toned to match the rest of the book.

TONING PAPER

Various toning agents are used to get the shade necessary to match that on a given piece of paper Coffee, tea, and permanganate of potash are most used in trying to approach the tone desired Coffee produces a brownish hue that is somewhat opaque, tea, a rather limpid brown, and permanganate of potash, a yellowish brown. Any of these toning agents should be put in the size, and the color should be tested before the size is applied to the paper. Permanganate of potash should be used in a weak solution, for it is very powerful

To test the shade of the toning size, a piece of unprinted newspaper should be dipped into it The paper, after being dipped, should be allowed to dry thoroughly before the tone produced can be judged accurately. If the tone is too deep, more water should be added to the solution; if too pale, more of the coloring ingredient is added. Anyone with a good eye for color will soon

be able to decide what coloring agent should be used to match a sheet of paper

BINDERS' TRICKS

REPAIRING BOOK CORNERS Occasionally a corner of a bookboard is injured during the process of binding. When a corner has been bent and crumpled before the book has been covered, it can often be successfully repaired. The layers of the board are separated with a knife at the damaged corner, and some paste is inserted between the layers. Then the corner is laid on a knocking-down iron and is tapped with a hammer on both sides The tapping must be done gently so that all the paste will not be forced out. The book is left about fifteen minutes for the paste to take hold, and the corner is knocked on both sides with a few firm strokes until it is made solid.

The same treatment may be given to a broken corner after the book has been covered, but in order to do the work the leather has first to be cut on a bevel with a straight-edged paring knife, and then pulled back off the corner. After the repairing of the corner is finished, the leather is pasted and worked back again in place. This can be done by a skilled workman so that the repairing will not be noticed except on close inspection

PEELING LEATHER On some skins it is possible to peel off the surface of the leather for inlay purposes, and thus save time in paring This is done by making a shallow, slanting cut on the leather with a sharp paring knife, then grasping the cut edge between the fingers and thumb and peeling the top layer off the skin. As the leather is being peeled off, a knife is occasionally used under the layer to force it off the undersurface. Long strips can be peeled off of some leather in this way. Small thin pieces for patching purposes may be taken off from the upper side of the leather with a sharp paring knife, if the knife is held very flat.

SPLITTING PAPER. To split a piece of paper into two parts, it is well pasted on both sides with a rather thick paste and is laid between two pieces of thin cambric. It is nipped in the press between pressing boards and left to dry. The cambric should overlap the paper all round. The cambric is then separated at one end, and it is carefully pulled off on the upper side of the sheet. If the paper has been well pasted and nipped, it will split, and one side will be left on each piece of cambric. The paper is removed from the cambric by soaking it in warm water. If left long enough in the water it will float off, but it should not be forced off Unless the pasting and nipping have been done properly, there will be places where the cambric and paper are not securely joined together, and at these places the paper will tear.

REJUVENATING CLOTH When the color on a cloth-covered book is rubbed off, it can be restored quite successfully if a piece of the same cloth can be found. The top surface of a piece of the same cloth is moistened, and the color is scraped off with a knife. While still damp, it is spread smoothly over the spot which is to be patched, and left to dry. Then the surface of the spot is waxed with a piece of paraffin

If the whole side of a cloth cover is stained and faded, the color may be restored by giving it an application of tinted size. The color is first mixed and then added to a little vellum size (see p. 327). The colored size is warmed, is strained through a piece of gauze, and is applied to the cloth with a small, fine sponge. A coat of clear size is finally applied over the color after it is dry.

Many cloth bindings may be cleaned and made bright by applying to them a dressing which is sold under the trade name of Leather Vita Leather bindings also may be treated with this dressing, though it is not a substitute for the leather dressing previously recommended (see Vol. I, p. 192)

Cleaning Vellum Vellum may be dry-cleaned with powdered chalk and bone dust First powdered chalk is applied to the vellum with a tampon, and it is then brushed off with a soft brush and is wiped off with a soft cloth If the chalk fails to clean the vellum, a stronger abrasive is used Chalk and finely ground bone dust are mixed together in equal parts, and a dash of powdered pumice is added. This preparation is applied and then removed like the plain chalk Sometimes powdered *sandarac* or *pounce* is found to clean vellum when used on it like chalk.

Flattening Vellum It is difficult to flatten the sheets of a book printed or written on vellum without taking the book apart. Moisture must be used, but the sheets should not be washed for fear of fading the ink or making it run, or of damaging an illumination Moisture has to be imparted to the vellum by means of steam. This can be done by laying the book open in one end of a long, high box that has a cover A small electric disk is put in the other end of the box, and on the disk is placed a steam kettle, like that used for bronchitis patients The spout of the kettle should be pointing away from the book, and the cord leading from the electric unit is run through a hole made in the box. The lid of the box is closed almost tight, and the electric current is turned on at the switch of the disk The leaves of the book are turned over from time to time as the steam penetrates them, and they must be watched and not allowed to get too damp. After the box is filled with steam, the cover may be closed tight and the electric current turned off If a little salt is added to the water in the kettle, the water will boil more quickly. When the leaves of the book are damp all over, the book is taken out of the box and is interleaved with interleaving blotting paper, or if this cannot be found, sheets of unsized paper may be used The book is left to dry heavily weighted, and as it dries, the interleaving sheets should be changed frequently and the weight on the book should be increased.

Unless a very long box can be found or made for this work, an empty cupboard or closet may be utilized for it It takes some experience before a binder is capable of treating a book or manuscript in this way. He must be ever watchful to keep the steam content of the box or closet not too dense, but the density should be uniform throughout the treatment. Live steam must not be allowed to come in contact with the book. I strongly advise that some experimenting be done on a comparatively worthless vellum book before attempting to treat the leaves of a valuable book Vellum books may be picked up for a few dollars each if old bookshops are searched

When the leaves of a vellum book that has been taken apart are to be flattened, the process is simpler and usually more successful. The folded sheets are freed of any soil, and each one is spread out as flat as possible. Sheets of unprinted newspaper as large as the vellum sheets are dampened on both sides with a sponge. As many sheets of white blotting paper are cut as there are sheets of vellum, and every two pieces of blotting paper are interleaved with sheets of dampened newspaper and are put in a pile. The pile of interleaved blotting paper is put in the standing press between boards and is left under pressure for an hour, or until the blotting paper is evenly dampened. It is then removed from the press, one dampened sheet is placed on each sheet of vellum, and the pile of interleaved vellum is put in the standing press and left for half a day with merely the weight of the platen on it. It is removed from the press, and since the vellum sheets are damp, they can now be smoothed out They are then put back in the press with dry sheets of blotting paper between them and are left under light pressure for another half day or overnight When they are taken out of the press they are examined, and if they are not flat they must be redampened, but redampening is rarely necessary. They are kept in the press for several weeks, the blotting paper is changed every two or three days, and the pressure

is increased as the vellum dries, though it should never be so heavy that the printing or writing is harmed. The amount of time necessary for the sheets to dry is dependent upon the atmosphere, but unless kept under pressure until thoroughly dry, the vellum will cockle worse than when the flattening was begun. This is work that cannot be hurried. Vellum should never be ironed with a heated iron, even though it be covered with some material. Direct heat will cockle vellum badly.

CHAPTER XXI

MATERIALS

Leather. Paper. Gold Leaf Glue. Paste

LEATHER

UNDER "Miscellanea" in Vol. I there will be found some general information about leather, and I am now adding some specific information that may be useful to a binder.

The leathers most used for covering books by the extra binder are levant, turkey-morocco, calfskin, pigskin, sealskin, oasis-goat, and niger Vellum is less frequently used because of its tendency to curl Persian-morocco and sheepskin (as it is now manufactured and called "roan" in the trade) are inferior leathers and are not suitable for extra binding Split skins, or suède, sometimes used for limp bindings, have little strength and should not be used for covering books There are other skins, such as sharkskin and alligatorskin, that may be used for covering, though they are thin and brittle and should be lined. Chamois, which is made from the underside of sheepskin, is used in bookbinding for lining purposes, but since it has a tendency to retain moisture, a better lining material is Canton flannel. Chamois skins should be kept well wrapped in a warm, dry place All skins used for covering should be kept in a cool place, and they must be protected from dust and from drying out. If the storage place is heated, it is a good plan to keep them in a closed chest and occasionally put a few pieces of cut potato in the chest. The potato should not be left with the leather for more than a few days at a time, and it should not come in direct contact with it The leather must be watched for fear of mildewing if this method of producing moisture in the chest is used The ideal way of keeping leather is in an air-conditioned, cool room.

Real "levant," or "levant-morocco," is no longer obtainable. It was made from the skins of a large goat inhabiting the Levant, and it had a peculiar odor by which it could always be recognized. These Levant goats are now extinct, but goats similar to them are found in South Africa They are known as "Cape goats," and their skins are very durable. Goatskins that are manufactured into leather come from the Swiss Alps, the Bavarian highlands, the Pyrenees, and other parts of the Continent. They also come from Turkey, the Cape of Good Hope, and other parts of Africa, as well as from South America

The best "morocco" obtainable for use in bookbinding is manufactured from skins coming from Turkey So-called "levant" is manufactured from the larger goats coming from the Cape. "Niger" is made from the skins of small goats found in Nigeria and along the Mediterranean coast of Africa It is a superior skin for use in covering books. When native-dyed, niger usually has a pinkish-red color that is not found on any other leather The finished skins often bear deep cuts made by crude methods of flaying (the process of removing the hair), and their color is not altogether even, because vegetable dyes are used and the skins are not cleared with acid However, the nuance in color is pleasing and lends interest to the cover of a book.

Calfskins are no longer well prepared for use in covering books They cut out quickly along the joints and show a tendency to dry-rot sooner than levant or morocco. Pigskin, when left undyed, is fairly durable. White pigskin is said to last well when it is prepared with lime. Sealskin was used in early times for covering books, but after that, it was not much used for this purpose until the beginning of this century. It is an oily skin, even after being well prepared for binding, and it is not favored by binders, because it is difficult to tool. It resembles oasis-goat in surface appearance. "Oasis-goat" is a name given to a leather that is made from skins coming from "the Cape." It is a smooth-surfaced

leather, and though it has a likeness to seal, it is less oily and has a harder surface.

Vellum is made from the membrane of calfskins (Vol. I, p. 11) and is not much used in America for covering books on account of its unruly tendency. It must be kept from light or it will grow dark and flake off on the surface This is probably one of the reasons why vellum-covered books were kept on shelves with their backs inward for some time after books in general were placed on shelves with backs outward. In mediæval times vellum was stained a beautiful purple, and from the beginning of the sixteenth century it was stained green in England.

PAPER

It is necessary for a binder to be able to tell the grain of paper, for whenever he must use it folded, it should be folded with the grain, and not against it. This is especially important when making end papers, for if the paper is folded against the grain, a stiff opening of the cover will result When paper is used to cover half bindings or portfolios, all the turnovers cannot be made to fold with the grain, and it is best to cut the paper in such a way that the long fore-edge turnovers fold over the edges with the grain.

"Laid" paper has a "wire mark," or "laid line," running across its width (see Vol. I, p. 182), and the grain of this type of paper, when handmade, always runs with the laid lines In the case of a "wove" paper, the grain is often difficult to determine, and the paper must be tested There are several ways of testing paper to find out which way the grain runs On many papers this may be determined simply by holding the full sheet or piece of sheet lightly, with the two opposite ends placed against the palms of the hands, and moving it from both ends against the center so as to feel its resistance, then holding it from the other two ends in the same manner and comparing the resistance felt in one direction with that of the other. In the case of a sheet of heavy wrap-

ping paper, a grain can be told at once in this way. With lighter papers a further test usually has to be made This is done by sharply creasing a piece of the paper in both directions and comparing the creasings. The crease following the grain will be smooth and tight, whereas the crease against the grain will be less smooth and flat. When this test fails to reveal the grain, a final test can be made that is certain to decide the matter A piece of the paper is dampened with a sponge on both sides and is left to dry on the workbench. As it dries it will curl, and the direction in which it curls indicates the grain of the paper.

The effect of printing a book in such a manner that the greater number of folds in the section run against the grain, instead of with it, is ignored by many printers When the "make-up" of a book is planned in this way, the pages will not lie flat and the opening will be stiff, whether the book is cased or bound.

Disregard of the grain in paper when printing a book is often due to economy, but it appears to be frequently due to lack of knowledge. I was amazed to read in a manual of bibliography the following sentence: "It does not matter which way a handmade sheet is folded in book making, the folds will have equal strength." This statement is only partly true. The folds will have about equal strength in a handmade paper whichever way it may be folded as the fibers cross each other, but it is not true that it does not matter which way the paper is folded in bookmaking. If in an octavo format the printing is so "imposed" that two of the three folds must be made against the grain, instead of with it, the section will be less supple than when two of the folds may be folded with the grain. For information about the manufacture of paper see Vol I, p 180

GOLD LEAF

Binders often find difficulty in laying gold leaf when it is very dry. If kept for some time, gold leaf becomes friable, and when it

is cut on the gold cushion or pressed over a blinded-in design, it breaks up and cannot be laid solidly without great waste of time and material. It is best to buy gold leaf in small quantities and use it freshly beaten. It should be kept in a tin box with a tight cover.

When a stock of gold leaf gets old and begins to show signs of breaking up as it is being used, it can often be reconditioned by putting a piece of cut potato in the box in which it is kept. This creates moisture in the box, and the leaves become less brittle But too much moisture should not be imparted to the gold in this way, as it affects its color and purity. This treatment, while not desirable, often makes gold usable when it could not otherwise be used. The manner in which gold is beaten into sheets is described on page 188 in Volume I.

GLUE

The glue generally used in bookbinding is made from animal hides, cartilage, or bones The better glue is made from hides, and since it has the greater gell strength and viscosity, it is the best of the "animal glues." It is usually bought in whole sheets, in cakes, or in ground form.

The best glue is the cheapest in the long run, for it absorbs a greater amount of water than a poor glue when soaked and prepared for use, and thus produces a greater amount of liquid. It will absorb from two to three times as much water as a glue that costs half its price, and it has a greater adhesive quality than the poorer glue.

There is a glue called "flexible glue," also used by bookbinders, which is made by cooking animal glue with water and a softening agent, such as glycerin. This glue is used on the backs of books because of its flexible quality. I prefer to use flexible glue mixed with hard glue — one part of hard glue to three parts of flexible. This makes the glue less stringy and enables the binder to spread it more thinly and evenly.

There is a tendency among binders to glue up the back of a book with a thick coating of flexible glue and leave it on, in the belief that it will make the back more flexible This belief is not well founded, for any binding material put on the back of a book constricts the back. When glue is properly applied to the back of a book it penetrates between the sections, and the amount of glue left between the sections after backing the book is sufficient to hold the sections together until they are later more firmly bound together with some material The surplus glue should be cleaned off the back, after backing (see p. 142) However, when the sections are being glued up for backing they should be held firmly together so that the glue will not penetrate to a depth that will make it visible on the inside of the sections.

Glue is soaked in water before it is heated Cake and sheet glue should be broken up before being soaked. The desired quantity is put into an earthen bowl, and water is poured over it As the water is added, the glue is stirred, and as much water is added as it will absorb. Then about a half-inch of water is poured over the moistened mass, and the glue is allowed to stand overnight. The next day it will be swollen in quantity and like a stiff jelly, and it is put in a gluepot and heated slowly A gluepot is of a double-boiler type, with a receptacle for the ingredients to be heated set into a receptacle to contain water. Glue should never be boiled, for boiling vitiates its strength Also, if glue is reheated too often, its strength will be impaired. When a pot of fresh glue is to be made, the gluepot should be cleaned by boiling it in an open kettle of water until all the old glue can be removed Glue that is evil smelling is either poor glue or glue that has been overheated or reheated too often.

Glue is thinned down by adding water to it after it has been heated The thinning down should not be done until after the glue has been heated, because it will not be possible to judge ac-

curately the thickness of glue until it is liquid It is a good practice to keep two gluepots going, one containing thin glue, which is suitable for use on paper or cloth, and the other containing heavier glue, which will be required for some other operation in binding.

Glue has advantages over paste for certain jobs in bookbinding. It dries more quickly than paste, and it should be used instead of paste when it is necessary for the work to "set" quickly. It warps material less than paste and should be used when warping is not desirable. On the other hand, a piece of glued material cannot be adjusted after it has been put in place as it almost immediately becomes a part of the material to which it is affixed. Glue must ordinarily be used quite hot, for it then penetrates the material to which it is applied and binds it more securely than when it is used too cool. It should be used cooler on paper than on cloth, as it takes longer to penetrate when cool and does not warp the paper so much. Cloth requires hotter glue, since it penetrates more quickly, and it prevents the cloth peeling off.

Because glue dries quickly, it must be applied without loss of time. A large brush should therefore be used for applying it. A large brush enables a worker to spread a greater surface than a small brush without redipping it into the glue. The brush should be freed from any surplus liquid as it is taken from the gluepot by drawing it over a wooden paddle kept in the pot or over a braided string arranged for the purpose across the top of the pot Then the brush should be dipped again into the pot to take up the amount of glue necessary to be used. A glue brush should not be allowed to dry against a paddle in the gluepot, for its hairs will then be broken off when freeing it from the paddle after the glue is reheated.

Glue is said to have been used centuries before the Christian Era as an adhesive for joining pieces of wood.

PASTE

Paste is made from flour produced from grains, from the stalks and other parts of certain grain-producing plants, and from various other substances such as starches and dextrines Commercially made paste serves well for some work in a bindery; it keeps in an unimpaired condition for a year or more, and since it is always ready for use it is convenient to have on hand. Preservatives are put into commercial paste which cause it to turn a grayish-cream color, and for extra binding it should therefore not be used next to the flesher surface of leather, or on paper used for guards or mending patches, the edges of which join another piece of paper. Paste can be bought in dry form and needs only to be stirred up with a little water to make it ready for use

I have recommended the use of commercial paste on the backs of books when they are to be covered with leather, but the paste should not be put directly on the leather itself, for if used on the leather without the intervention of any medium, it may strike through the pores of the skin, and it will then take the bloom off the leather and may possibly stain it If the leather is pasted with a paste containing no acids or other injurious substances before it comes in contact with commercial paste, the commercial paste put on the back of a book will not penetrate to the outside of the leather The commercial paste is recommended for the back because it dries quickly and has a body that is lacking in most pastes made in a bindery.

Paste, instead of glue, is used for covering bound books, because, having a greater moisture content than glue, it softens the leather and makes it pliable so that a binder can mould it over the bands and the sides of a book Another reason for preferring it to glue for covering bound books is that it dries more slowly than glue, allowing the binder more time to perform the operation of covering However, glue is used for covering so-called

"limp bindings" because they are really casings, and since no opportunity is given the binder to "make" the grain in the leather of a casing, it is imperative that the grain be "set" at once as the leather comes in contact with the material to which it is affixed

Rice flour, gluten flour, or any other flour may be used by the binder for making paste. To make it, some flour is put into a bowl, and cold water is added gradually until it is the consistency of thin cream. As the water is added, the mixture is stirred constantly until it is free of lumps It is then transferred to a cooking vessel, and boiling water is added in the proportion of about one quart of water to four ounces of flour. The mixture is brought to a boil and is boiled for about three minutes, during which time it is constantly stirred If it appears to be too thick when it is taken from the stove, hot water is added immediately until it is of the proper consistency. It will thicken as it cools, and allowance should be made for this thickening. Some binders add powdered alum to the flour as it is being mixed with water This acts as a preservative, but paste made from flour takes little time and is cheap to make, so it is not an extravagance to throw away spoiled flour paste and make it fresh when necessary. Before the paste is used, it should be thinned to the proper consistency for the job to be done

A whiter paste for mending paper may be made of rice flour than can be made of ordinary flour. Both pastes are made in the same way, but I prefer a paste made of starch for mending and for use on leather.

To make paste of starch in a quantity large enough to last a one- or two-man extra bindery for a few days, three heaping tablespoonsful of ordinary laundry starch are put in a mortar such as that used by a pharmacist Cold water is gradually added while the mixture is stirred until it becomes the thickness of thin cream. Meanwhile, a kettle of water is brought to the boiling point and is let to boil for at least a minute. Then the mixture is

first set in motion with a large spoon, and the boiling water is rapidly poured into it while it is being constantly and vigorously stirred, until the mixture begins to thicken and appear glossy. The pouring is instantly stopped at this point, and the mixture is beaten rapidly until smooth When finished, it should have a translucent, and not an opaque, appearance. If it looks like dough it will not be adhesive. If it has a live, glossy appearance it will have a good adhesive quality.

The reason for using a mortar is that a heavy vessel is needed for the operation, since one hand is being used for pouring water and the other for stirring, so there is no hand free for holding the vessel It must be held in place by its own weight, or it will slide about and prevent the worker from stirring the mixture properly The secret of making a good paste from starch is to have the water boiling hot as it touches the starch, to stir and pour simultaneously beyond the point where the mixture seems to grow thin and watery, until it begins to thicken again, and then to stop pouring instantly, and beat the paste vigorously for a moment.

For use on paper, paste should be thinner than for use on leather. The thinner the paste is used on paper, the less danger there will be of wrinkling, but if used too thin, the paste will strike through the paper and will not bind securely. With both glue and paste the tendency is to use too much and to use them too thick. A thin coat of either glue or paste ensures a better joining of material than does a heavy coat.

Sufficient starch paste for a day's work should be taken from the supply bowl and beaten to a smooth consistency After being used for a given job, it should be covered with a dampened cloth, and the brush should be washed out Starch paste forms a thickened covering when left to stand, and this should be removed on one side of the bowl far enough to uncover the paste to be taken from the bowl. The paste should not be dipped into here and there, but should be left in the supply bowl covered with its

thickened crust. Commercial paste should be taken from its container in such a way that its surface is left smooth

I do not agree with those who advocate using a flat brush for applying paste for large surfaces. In my opinion a fairly large, round brush is the best brush for this purpose, if held and used as described on page 43. For very narrow surfaces, either a flat brush or a finger may be used to advantage, though when a binder has learned the trick of wielding a large brush expertly, he can neatly paste even the smallest surface. All paste brushes should be washed clean after using, and when not in use should be left soaking in sufficient water to cover the hairs where they are fixed into the end of the brush. The water should be changed frequently

CHAPTER XXII

FINISHING

Finishing tools Preparing leather for tooling Tooling Blinding-in. Correcting tooling Running lines

THE term "finishing" comprises all the work that must be done in binding after the forwarder has completed the covering and "filling in" of the cover. This includes preparing the leather for tooling, designing the decoration of the cover, tooling the design and title on the binding, and polishing the leather sides and back of the book.

FINISHING TOOLS

Tooling consists in impressing heated tools by hand on some surface such as leather, vellum, or cloth The tools used for this

Fig. 155

purpose are called "finishing tools." Each tool is made of metal which has a slender shank with an enlarged end on the face of which some device is cut (see Fig. 155). The device may be a

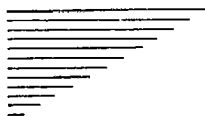



Fig 156

pictorial design, a dot, a short straight line, or any small engraved outline These tools are used in combination with one another to form the designs. The straight lines are cut in different lengths and widths, and they may be single, double or triple. The pattern for a set of single straight lines is shown in Fig 156

For tooling long lines a "fillet," or "roll," is used (see Fig. 157). A fillet is a wheellike piece of metal on the edge of which one or more lines or a continuous design are cut Several line fillets of different gauges are desirable to have in a bindery. The fillets with designs on their edges are not often used by extra binders. Their use makes it possible to speed up tooling, but the set de-

Fig. 157

signs obviate the possibility of artistic freedom of expression. Building up a design with small tools offers a greater opportunity for diversity in the arrangement of decorative forms

Curved lines are tooled with "gouges," which are curved line tools. They are made in sets, each set representing a series of segments of concentric circles, and each tool a single segment of one of the circles. Sets of gouges of various degrees of curved contours

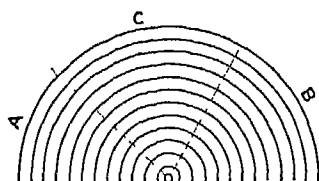



Fig. 158.

are cut from patterns made by dividing concentric circles into different arcs (see Fig 158).

For running lines across the backs of books, a "pallet" is used (see Fig 159) A line pallet is a straight line tool of greater length and sturdiness than those in a set of straight lines A length of about three inches will be found to be most satisfactory for a pallet, and for best results the contour of the line should not be curved A long straight-surfaced pallet made of thick metal tapered to the width of the line has better balance than a shorter tool

constructed of lighter metal The weight and length of such a tool aids in keeping a line straight when tooling over the rounded back of a book. Pallets with designs cut on their edges also are used for tooling over backs of books. They are usually made shorter than the line pallets Because they have a wider tooling edge they are made of heavier metal than line pallets and conse-

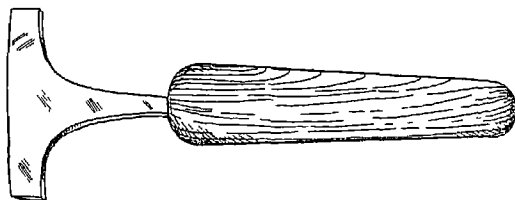



Fig 159.

quently are fairly well balanced when made shorter than pallets with a straight line Their length is cut down as much as possible because they are expensive to have made and every added flower to be cut adds appreciably to the cost of the pallet. These pallets are not often used by the extra binder.

PREPARING LEATHER FOR TOOLING

POLISHING LEATHER WITH AN IRON TOOL. When a book comes to the finisher's bench, if it has been covered in a grained

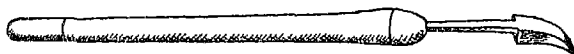



Fig 160 A

leather such as morocco or levant, the leather is polished with a heated polishing iron. There are several models of polishing irons, three of which are here being illustrated. In Fig. 160 A a narrow iron is shown suitable for use on the back of small and medium-sized books and for inside margins. Figure 160 B illustrates a broader iron which is used on the edges and sides of books

and on the backs of large books. The rounded iron shown in Fig 160 C is used only on the sides of books where a large surface is to be polished.

The polishing that is done before tooling is chiefly for the purpose of smoothing out the grain and irregularities of the leather

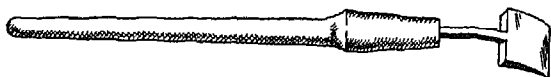



Fig 160 B

so that it may be more easily and successfully tooled. Hence no effort need be made to get a high polish on the leather The polisher is heated on the tooling stove (Fig. 15) until it just sizzles lazily when a few drops of water are dropped on it. Great care must be taken to avoid having the tool too hot, for fear of scorching the leather. After being heated, the smooth face of the polisher is cleaned off with a piece of very fine emery paper (four

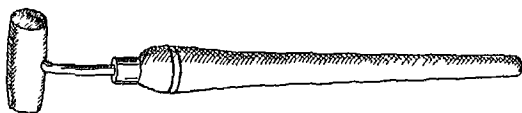



Fig. 160 C

or five o), and it is best to rub the polisher on the flesher side of a piece of leather before using it on a book. When applied to the leather, it must be kept moving constantly to avoid leaving marks, and it should be passed across the leather from four directions with increasing pressure until sufficient polish is attained.

A pad made up by pasting a piece of split leather or a piece of any unsplit leather placed grain side down on a binder's board will be found useful for rubbing off both polishers and tools. A convenient size for the pad is about five by six inches The fine emery paper, if mounted on a piece of thin cardboard about three by four inches in size, is more convenient to use for cleaning tools

than if left unmounted, and when applied to the face of a tool it is less likely to bevel off the edges or damage the design.

For testing the heat of polishing irons and finishing tools a large sponge is put in a shallow dish containing water It is an advantage to use an oblong dish instead of a round one so that water can be taken up on the fingers without displacing the sponge When a polisher or tool is too hot it is cooled by placing it on the wet sponge. Care must be taken not to let the face of a finishing tool come in contact with the sponge, for in so doing water is likely to be left in the design of a tool, and the moisture will blur the tooling. This applies equally to fillets, the tooling edges of which must be free of moisture when used on a leather cover

Turning Grain of Leather. If a heavy-grained levant is used for covering a book, it is advisable to "turn" the grain preparatory to tooling rather than to polish the leather with a polishing iron. Many binders "crush" the grain of the leather on the sides of a book, but this is a practice of which I do not approve. When the sides of a leather-covered book are so treated they are dampened and are put into the standing press one at a time under tight pressure with a metal pressing plate over the leather This actually crushes the natural grain and alters it A method used by French binders for dealing with a heavy-grained leather so that it may be easily tooled leaves the pattern of the grain untouched, and I much prefer it to "crushing." The binder, when using this method, which the French speak of as "faire le grain," "turns" the grain instead of crushing it. That is, he "makes" the grain and does not destroy it

To turn the grain of a leather binding, the leather over the sides and back is moistened with a small damp sponge Moistening must be continued until the grain of the leather becomes supple. Then an agate or a bloodstone burnisher (see Fig. 54 A) is applied to the leather on the back and on one side of the book at

a time. The burnisher should be held with the handle in the armpit and with the hand on its shank It is first moved over the surface of the leather with light pressure, and pressure is increased as needed for turning the grain If the grain does not turn easily, the leather must be moistened until it is damp enough to yield to the pressure of the burnisher. When turning the grain, the burnisher is used with the pattern of the grain and must not be run over the surface of the leather in the opposite direction, or

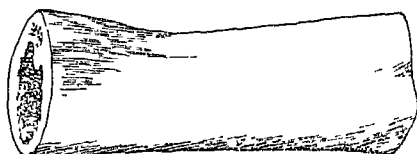



Fig 161

against the grain. The grain on the back of the book is usually turned first, and the leather on each side must be kept moistened until its grain has been turned When first attempting to turn the grain of leather the worker is likely to err in not having the leather sufficiently dampened. It requires some time before moisture penetrates the leather and it has to be dampened time and again before it is ready for turning the grain.

Polishing Leather with a Bone Tool After the grain has been turned, the surface of the leather is polished with a piece of ivory or bone Since ivory is expensive and not easily obtainable, a bone from some large quadruped may be used (see Fig 161), or even a rib bone of a steer will be found satisfactory. If importuned, a butcher will supply a bone of this type. To prepare such bones for use they must be first boiled and made perfectly clean. Then the surface of the bone is smoothed by rubbing it with a "tampon" dipped in oil and powdered pumice. It should be rubbed vigorously with a clean piece of flannel cloth in order

to give it a high polish. An implement of this kind is lightly rubbed over the surface of a leather cover after the grain has been turned, in order to give the leather a polish. It should be applied to the leather with a circular motion.

PASTE-WASHING LEATHER When leathers such as calf, sheep, or russia are used, they should be paste-washed before tooling, in order to fill up the many fine pores that otherwise would absorb the glaire preparation applied to the leather to make the gold adhere. If freshly dyed morocco or levant skins are used for covering they rarely need to be paste-washed or sized, but when these skins have dried out before they are put on a book or when covers are cut from the belly or flank of a skin, it is often necessary to paste-wash them. Otherwise it is difficult and often impossible to make the gold stick I do not approve of paste-washing or sizing leather if it can be avoided, for this sort of treatment always takes away the luster of the leather, and a grayish cast over the leather is likely to result even when the work is carefully done With nonporous leathers it is usually sufficient to wash them over before tooling with a solution of diluted acetic acid or with a pure mild vinegar. If vinegar is used, care must be taken to make sure it is of the best quality and is free of sulphuric acid.

To paste-wash a leather cover some starch paste is put into a receptacle and is beaten up until it is smooth and free of lumps. It is thinned down with water to a consistency of thin cream and is applied evenly with a small, clean sponge Then the sponge is wrung out in clear water and is passed over the leather to even the paste and clear off any excess The book is stood up and left to dry.

Calf and other very porous leathers require a heavier paste-wash than morocco or levant and should be sized after the paste wash is dry. The size may be made of vellum cuttings or of gelatin, and it is put on warm. To make a vellum size, cuttings of vellum are first soaked in water and are boiled up with water added

when necessary until the viscous properties are freed. The solution is then strained through a thin piece of muslin. It should be of a consistency easy to spread and it is applied while warm. To make size of gelatin, a pure gelatin must be used, preferably that which is in sheet form About a quarter of an ounce of gelatin is dissolved in a half pint of water It is then heated slowly, and when fluid it is strained through muslin and is reheated before being applied to the leather Both gelatin and vellum sizes are best made in a double boiler to avoid scorching.

TOOLING

After the leather is prepared, a book is ready for tooling. Tooling may be either "in blind" or "in gold." In blind tooling, the impressions made on the leather remain as left by the hot tool, and the design stands out because the leather has been somewhat darkened in the process, whereas in gold tooling, after the first impressions are made they are covered with gold leaf and are retooled. This produces a design in brilliant contrast to the leather.

Tools used especially for blind tooling are usually cut intaglio like a die or seal. The design is sunk in the face of the tool and is brought out in relief when impressed on leather. Blind tooling may be done with tools cut for gold tooling, but the effect is not so rich as when die-sunk tools are used. For gold tooling the design is outlined on the surface of the metal, and all metal not a part of the design is cut away so that when the tool is impressed on leather the tracery of the design appears stamped in

It is customary for a finisher to tool the back of a book first, though I prefer to leave the decorating and titling of the back until after the sides of a binding have been tooled. The back lies between the two sides when the covers of the book are opened, and the design from fore-edge to fore-edge should be considered as a whole. For this reason it would seem the logical thing to design the back before tooling the sides, but I find when I have done

this I frequently want to make changes in the design for the back after the sides have been tooled. There is a certain inspiration gained by seeing the design after it has been tooled on the sides of a book, and I am more successful in linking up the sides with the back after they have been tooled. Especially when scant decoration is put on the back, proportion is of great importance. The size and disposition of type for the title, how many or how few lines to use, whether to leave out or to place a decorative motif here or there to connect the decoration with the two sides — all these matters are often difficult to determine. With the leather back exposed to view between the two tooled sides I find the decision can be better made than when it is arrived at while working on a paper pattern before the values of the decoration for the covers have been brought out through tooling.

Tooling Through a Paper Pattern. Presuming that the leather on the back has been washed off with clear water and afterwards either with an acid solution or a paste wash, the design for the side of the book which has been accurately traced on paper is fastened in place by means of scotch tape. It should be adjusted perfectly and held securely. The book is then placed on the workbench with a board under it so that its position may be changed by moving the board without moving the book, with the danger of scuffing the leather. The board on which the book is placed should be lined on the upper side with a piece of flesher skin, and the underside should be smooth so that it may be turned easily. A revolving stand on which to lay a book for tooling has been invented in the bindery of Douglas Cockerell and Son (see Fig. 162) It is made by mounting a flat, round board, covered with a soft, smooth material, on another board. The lower board is stationary, and rests on six rubber knobs which are screwed into the bottom of the board to raise it and keep it from slipping. Ball bearings are placed between the two boards so that the top

one may be turned around easily, thus making it possible to shift the position of a book with the least effort. This tooling stand will be found especially useful when tooling the sides of large books

The necessary tools and implements for tooling should be as-

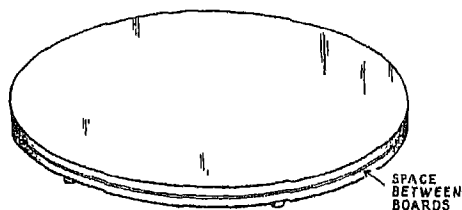



Fig 162.

sembled before beginning to tool a book. All the tools for impressing the design on the book should be collected and placed in a box so that their faces may be readily distinguished (see Fig. 163). Any fillets to be used should be chosen and laid out on the bench. A wooden rule, a finishing folder (see Fig. 164), a shallow

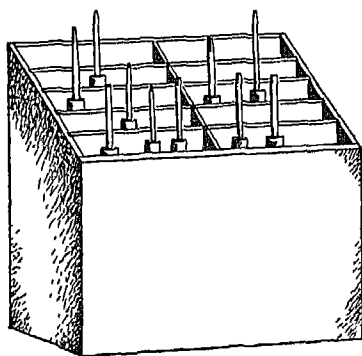



Fig. 163

dish containing a large sponge and some clean water, a small soft sponge, a mounted piece of emery paper, a box for holding gold sweepings, and a flesher-covered pad for cleaning tools should all be in place on the workbench before beginning to work When the finisher is ready for tooling, the tools are selected from the

box and are placed on the lighted stove in the order in which they are to be used. They should be watched and pulled back from the heating disk from time to time so they will not be overheated. Overheating takes the temper out of tools and renders them difficult to use They require a much greater length of time to heat after the temper has been taken out, and they do not hold their heat. In fact, an overheated tool is sometimes unusable.

Before beginning to impress a design through a paper pattern, the finisher should arrange the height of his book so that the tools can be impressed accurately and without effort, sighting

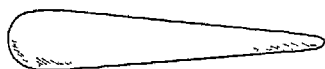



Fig. 164.

them from the "heel" or the "head." The "heel" of a tool is at the lower end of the engraved figure The opposite end is called the "head." Most tools should be sighted and "struck" from the heel, though occasionally, when the head of the tool is very pointed, it is advantageous to turn a book, in order to "sight" and place the tool from the head. "Sighting" means noting where the tool form begins. "Striking" a tool means placing it.

If the book seems too low for comfortable and efficient work, it can be raised by putting blocks of wood under it. If too high, the worker should lay a large wooden block on the floor and stand on it while working.

The heat of a tool to be impressed through a paper design varies with the leather. Some leathers take an impression readily, while others are difficult to impress, and one can only learn the degree of heat necessary for this operation after experience with different leathers. The object in impressing tools through the paper is to outline the design on the leather accurately with sufficient clearness so that it may be "blinded-in" or blind-tooled after the paper is removed. It is better to have a tool too cool than

too hot, for if a tool is heated so that it makes too deep an impression or leaves the impression burned in, the evenness of the tooling is unalterably destroyed, whereas, if the impression is too faint, the tool can later be accurately put in place by consulting the paper design. For most leathers a tool should be cooled down by laying the shank on the wet sponge until it just fails to sizzle when tested with a few drops of water Only a faint impression is necessary to guide the finisher in blinding in his design after the paper is removed.

When a design is of a kind known as an "all-over" design, or is one which is made to cover the whole side of a book, the finisher must have a definite system in putting down his tools, or parts of the design will be overlooked. Each heated tool is impressed through the paper with only enough pressure to leave the tool form clearly outlined on the leather If straight lines are a part of the design they should be marked at each end with a small heated straight line tool. These ends are joined, after the paper pattern has been removed from the book, by running them in with a finishing folder guided by a wooden straightedge.

In removing the paper pattern, one corner at a time should be lifted so that it may be observed whether all the tools have been impressed on the leather. In case any have been overlooked, since the pattern is held in place at one end it can be accurately fastened down again in order to add the missing impressions.

Blinding-in After the paper pattern is removed the leather is slightly dampened with a small moist sponge, and the design is "blinded-in" if gold is to be used. Blinding-in is the process by which a design is made to stand out in crisp, evenly impressed outline. It is one of the most important operations in gold tooling. If properly done, it makes for greater ease in putting down tools through gold leaf, and it ensures greater perfection in a gold-tooled design

When blinding-in, the tools are struck on the bare surface of the leather in the same manner as is used for striking them through the paper. They are heated only just enough to attain a clear, well-outlined impression. The amount of heat needed for this work varies with different leathers and can be determined only after striking a few tools and noting whether more or less heat is required It is best to start with a fairly cool tool and increase the heat if necessary, as when working through paper, for otherwise the outline of a tool may be burned in and the whole design damaged, for burned-in impressions cannot be successfully hidden. The only possible way of concealing them is to inlay a piece of leather over the impression and retool the outline. If the leather has been so badly burned that it is cut through and shriveled up, a stuffing must be put over it to level it before the inlay is put in place. A satisfactory stuffing can be made by fraying out a piece of sewing cord, cutting it into very fine bits and mixing them with paste to form a rather heavy plastic material, which the French call a *pâte* Scrapings from a piece of cover board mixed with paste may also be used for this purpose, but care must be taken to have the coverboard material well pulverized.

Finishers differ about how to strike or put down a tool most successfully, and each finisher develops a technique of his own. Generally speaking, a tool is best struck from either the head or the heel. That is, the tool is put down by placing the head or the heel into the impression and instantly bringing the whole tool into position. All parts of the face of the heated tool should meet the leather almost simultaneously, and no part of it should be allowed to linger in the impression. To facilitate the placing of a tool, the head, or top, of the tool design is indicated by a line cut across its shank. Even tools representing dots and squares or other nonfloral forms are thus marked so that they may always be struck with the same side uppermost when they must be put

down in an impression already made, for hand-cut tools are not mechanically perfect. Fillets and pallets have one side flat and the other side somewhat rounded. When they are used, the flat side should be kept to the left.

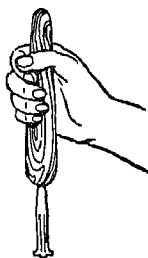
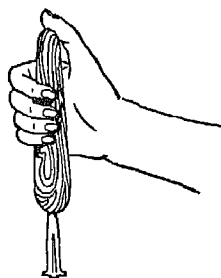



Fig 165 A. Fig 165 B.

When striking a tool it is held in the hand with the fingers and thumb wrapped around the handle as shown in Fig. 165 A, or if preferred, the thumb may be held on the top of the handle (Fig. 165 B) A leather finger and thumb cut out of a pair of heavy gloves are placed on the index finger and thumb of the left hand

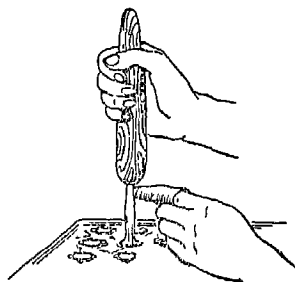



Fig 166

to protect them from the heat. The fingers and the thumb of the left hand are rested on the surface of the book or on the table near the book, if the tool to be struck is on the edge of the book. As the heated tool is brought up with the right hand, the forefinger of the left hand is placed back of it well down on the shank of the tool and guides the tool into position (see Fig. 166).

Since the left hand is steadied by being anchored, as it were, to a solid surface, the tool can be more quickly and accurately placed with the aid of the steadied forefinger than it could be without some such guide.

After all the tool forms have been blinded-in, any lines in the design must be blinded-in with a fillet (see Fig 157). When the fillet has been heated to the proper temperature it is grasped by the handle with the hand held down near the metal shank of the wheel, and the end of the handle is rested on the shoulder. To guide the fillet when it is being placed for running the line, the

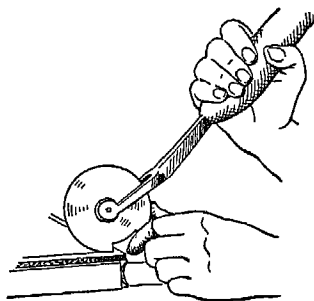



Fig 167

left hand is rested on the book or the workbench and the metal wheel is grasped between the forefinger and thumb in the cutout space which interrupts the continuity of the line. Steadied in this manner the fillet is brought up to the line to be run, the end of the fillet line on the far side of the cutout metal is placed at the very beginning of the line indicated on the book (see Fig. 167), and the fillet is moved ahead by rolling it forward on the line until it reaches a distance of about a quarter of an inch from the end. To finish blinding-in the line, the fillet is then removed from the book and is grasped with the left hand just back of where the metal is cut out. It is placed back on the line so that when rolled forward the end made by cutting out the metal will just reach the end of

the line to be tooled (see Fig. 168). In finishing the line the fillet is held back a bit with the left hand while it is being rolled forward with the right hand and shoulder. This brake applied to the

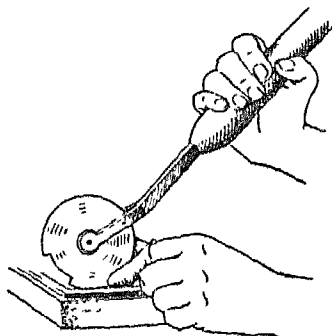



Fig 168

motion of the fillet is for the purpose of preventing its being pushed too far, which would result in one of its points digging into the leather beyond the line. A wooden rest such as that shown in Fig. 169 may be used to rest the handle of a fillet on when it is on the tooling stove.

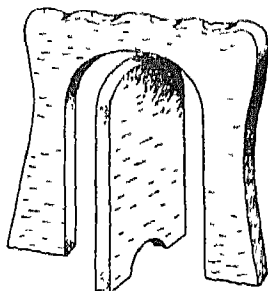



Fig 169.

Until a worker's eye has been trained, it is best that he check all lines for straightness by laying a straightedge along their length. Any deviation from trueness will thus be shown up and the line should be corrected before it is gold-tooled.

CORRECTING TOOLING. There are various ways of correcting a crooked line or a badly placed tool, though none of them are altogether satisfactory. If the leather be levant or a grained turkey-morocco it should be dampened with a large camel's-hair brush saturated with water, and the water should be spread out beyond the immediate vicinity of the place where the correction is to be made, in order to avoid leaving a rim or watermark on the leather. Then a fine-pointed needle may be used to pick out the incorrect traces. On no account should the leather be rubbed with a folder or with the hand. After the picking out has been carefully done a cold tool should be impressed in the damp leather in the proper position. When a line is being corrected, a new trace is made with a folder run against a straightedge and the line is run in again on the dampened leather with a cold fillet. A heated tool should not be used on leather that is damp. Later, after the leather is dry, the heated tool or fillet is used to blind-in the correct trace crisply.

On calf, seal, or any other naturally flat-surfaced leather a needle should never be used. The most that can be done to remove incorrect impressions on these leathers is to dampen the leather several times, being careful to spread out the moisture over the whole side of the book, and then put the tool or fillet impression in correctly Tools badly placed on a calfskin cover present an almost hopeless situation. On other ungrained skins the old traces can be fairly successfully eliminated with application of water, if the cold tool or fillet is applied at once after the leather has been thoroughly dampened.

RUNNING LINES Running a perfectly straight line seems difficult when first attempted, but if a few things are kept in mind and put into practice, the art can be mastered without great difficulty. The first thing to remember when using a fillet is that both feet should be placed firmly on the floor, preferably some dis-

tance apart A true, straight line cannot be run with certainty by a worker who has one foot stuck back of the other and who stands in a slouching position before the workbench Firm stance and a proper position of the body are of great importance and a proper height of the book worked on is of equal importance.

The book should be higher for tooling lines with a fillet than for tooling with short-handled tools For running lines it will be found best to bring the book up as high as it can be worked on and the far end of the line reached without effort. The finisher must keep the end of the handle of a fillet resting on his shoulder, and his grasp on the handle should be light but firm. As he rolls the wheel forward, his eye must be kept an inch or more ahead of the fillet, and he must not waver or be fearful, but should attack the job with confidence. This does not mean that he can be careless or overconfident or hurried. Just a steady, quiet, confident attitude is the one that wins out in running a good line. Another point of value is that as the binder rolls the fillet forward he should not hold his body stiff, but should let it follow the moving fillet and not depend entirely upon his hand to do the work His hand must hold the fillet lightly and merely guide it, his body, not his arm, should provide through the shoulder most of the force for the operation.

Running a straight line on the side of a book is much like running a bicycle over a line marked out on the road. If the rider doesn't "hug the saddle," but sits with good balance and looks ahead of him with confidence instead of directly in front of him with bated breath, he can ride a very straight course Good position, relaxed muscles, confidence, and keeping the eye ahead of the fillet when running a line on a book will win half the battle, and I have never known an expert finisher who didn't consciously or unconsciously incorporate these principles into his manner of working.

It is often a help when tooling the side of a book to put a cov-

ered weight on the book so that it will not slip when being worked on. The weight, however, must always be placed so that it does not cut off any light

By adjusting the position of a book to the light the worker is aided in seeing the outline of a tool clearly or in distinguishing the definition of a line. In the case of tools, they are usually better defined to the eye if they are in a position perpendicular to the worker In order that a line may be seen to the best advantage, a book should be turned so that the light strikes across it, not along it. Turning the book so that it is at a slight angle to the light is sufficient to make a line stand out clearly if the light comes from a window in front of the workbench.

CHAPTER XXIII

FINISHING

Gold tooling Blind tooling. Tooling vellum, silk, and cloth. Inlaying leather

GOLD TOOLING. Having blinded-in a design, the finisher is ready to tool the book in gold. To the tools assembled on the workbench for blinding-in, a gold-cleaning tool (Fig. 170) and a cotton tampon (Fig 171) should be added. A cotton tampon is made by screwing up the ends of a piece of absorbent cotton and then twirling it around on the palm of the hand to give it a

Fig 170.

flattened, firm surface. The best quality of cotton should be used, for otherwise fibers of the cotton will be pulled off and remain in the tooling when the gold is being rubbed off with the tampon. A gold cushion and knife will be needed (see Fig. 55 A), an-

Fig 171.

other cotton tampon should be made ready, and a book of gold leaf should be laid out. The gold cushion should be shielded from draughts by a guard (see Fig 55 B) and placed on the workbench in such a position that it will not cut off any light from the work This guard may be made of heavy corrugated board. It is cut to the desired height and length, and then scored on the outside with a knife point in the two places where it is to

be folded. Each wing is then folded over the center strip and is bound first on the outside of the fold, while the guard is folded, and then on the inside with a piece of gummed paper. It is also bound on all outside edges. This makes a sturdy shield and one that can be put away flat over the gold cushion.

A little oil or grease should be put on the flattened surface of one tampon and then distributed evenly by rubbing the tampon with a circular motion over a piece of clean white paper. This oiled tampon should be kept near the gold cushion on a clean paper, for it must not be allowed to become soiled. Vaseline, coconut oil, and other oils are used for greasing the tampon. The more volatile the oil the better, and a pure almond oil will be

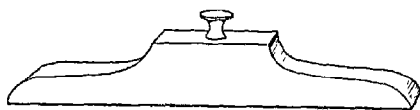



Fig 172.

found most satisfactory. The least possible oil should be used on leather when tooling, for the traces are difficult to remove, and the luster of gold tooling is harmed by it.

A gold cushion should be brushed off and its surface freshly prepared periodically. To prepare a gold cushion so that gold leaf can be picked off it easily, a little powdered pumice is sprinkled on it and is spread over it with the gold knife. Then the cushion is beaten lightly with the knife until all excess pumice has been removed.

The gold knife should be kept on one side of the cushion, and its blade should never be touched with the hand, for all healthy human skin contains a certain amount of oil, which, imparted to a knife blade, would cause the blade to stick to the gold in the process of cutting it into strips.

For lifting the gold from the cushion a gold lifter such as that

shown in Fig. 172 is useful. This is merely a shaped piece of wood, with a piece of thin felt glued on its undersurface. The felt should be kept clean and free of grease.

When the book is ready for tooling, sheets of gold leaf are laid out on the gold cushion. Gold leaf comes to the binder in "books," each leaf of gold laid between sheets of thin paper. For most extra work it is used double It is somewhat difficult to manage, and there are various ways of taking it from the book. The easiest way, I find, is to open the book and expose the leaf of gold to be taken out, then to bend half back the upper empty sheets of paper that cover it, so that part of the sheet of gold is uncovered. The book is held in the left hand by the papers that are turned partly back; it is turned over, and the uncovered gold leaf is let to fall on the cushion The top of the book lying on the cushion is rubbed lightly to make the leaf of gold stay in place The turned sheets are rolled open with the left thumb, allowing the rest of the gold leaf to come in contact with the cushion. It is freed from the book by rubbing the surface of the book which covers the whole leaf, and the book is removed. The gold leaf is lightly blown upon at the center to straighten it out flat, and another leaf is put down on top of it in the same way and is blown flat. This method sounds complicated when explained, but would appear quite simple if demonstrated.

If one prefers, the gold leaf may be taken out of the book with the gold knife, but this method requires greater dexterity, as the gold has to be handled in mid-air where the slightest movement of air makes it unmanageable. To remove a leaf of gold from the book, the book is placed on the gold cushion and the paper covering it is turned back The gold knife is then carefully slipped under the center of the leaf and the leaf is lifted up and turned over onto the cushion. It is then blown flat with a light, quick breathing on it directed on the center of the leaf When used double, another leaf is laid upon it, though this method of taking

out gold is not well adapted to laying one sheet of gold on another successfully.

When laid out on the cushion, the gold is cut into sizes suitable for laying over the part of the design to be tooled, by drawing the gold knife across the leaf For laying over lines it is cut into long, narrow strips. For laying over an all-over design it is cut into as large pieces as can be easily handled A half sheet can be picked up on the gold lifter and put in place without difficulty

Before laying gold, the tooled impressions must be painted with "glaire" Glaire for tooling is a preparation made of white of egg and vinegar, which acts as a binder between the gold leaf and the leather when a heated tool is pressed through the gold

To make a small quantity of glaire the white of an egg is broken into a bowl, taking care to leave none of the yolk Vinegar is added, the amount varying with the outside temperature and the size of the egg white. In hot summer weather almost a full teaspoonful of vinegar is the proper quantity to add to the white of a medium-sized egg. In wintertime this amount is shaded to about three-quarters of a teaspoonful, else the glaire will be too thin. This mixture is beaten with a common kitchen egg beater until it stands up stiffly. The bowl is then put aside until all the liquid in the foamy mass has been deposited in the bottom of the bowl. This requires several hours at least, though one is certain of getting the greatest quantity of glaire possible if it is made in the late afternoon and allowed to stand overnight After standing a sufficient length of time, the bowl is tipped and the liquid glaire will run out from the stiffened foam.

Glaire should be kept in airtight bottles, preferably bottles with ground-glass stoppers (see Fig 173) It will be more satisfactory if each batch of glaire is put into several such small containers and one at a time put into use, for exposure to the atmosphere causes glaire to deteriorate and frequent dipping into it may contaminate it.

Old, evil-smelling glaire is not fit for use, for it is bound to have deteriorated chemically. Many binders put a preservative into glaire, such as a small piece of camphor, but I think this practice is of doubtful value, and since the cost of glaire is so slight it does not seem worth while. Glaire will be found to be a better "binder" if allowed to stand a day after being made.

A certain amount of moisture should be present in leather when being gold-tooled, and if the leather has dried out, the moisture must be restored before beginning the work of tooling. This is made necessary if solidity of the gold is to be gotten in the

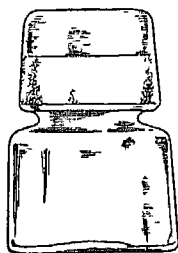



Fig. 173

tooled impressions, because some slight steam or vapor is required to cause the albumen in the glaire to coagulate when the heated tool is applied over the gold leaf, in order to make it serve as a binder between the leather and the gold. Unless the albumen in the glaire coagulates as the heated tool is impressed, the gold will not stick firmly.

It will be fatal if the finisher attempts to supply the necessary moisture to make glaire clot by tooling over glaire not sufficiently dry, for this will cause the tooling to be burned in. The moisture for generating steam to induce coagulation of glaire when the heated tool is put down over the gold must be supplied by the freshness of the leather under and around the glaired surface, and not by glaire too wet.

To freshen leather before tooling, it should be washed off with either plain water or water and vinegar. The vinegar which is astringent, tends to close the pores of the skin.

Many of the older European finishers apply clear urine to leather in order to condition it for gold tooling. Urine when so used must be kept for some time and allowed to begin to ferment. When fermentation takes place, the urea in urine is changed into carbonate of ammonia, which makes it alkaline. The use of urine for this purpose originated with the manufacturers of leather. As a substitute for a urine wash on leather some finishers use a small amount of liquid ammonia in their glaire.

An old finisher in a London shop where I was once working gave me his "secret" for successful gold tooling. I pass it on for what it is worth: "First apply clear urine to the leather, then a weak solution of oxalic acid, finally a thin paste wash and two coats of glaire." The action of the urine has already been described as a sort of freshener of the leather; the oxalic acid clears the skin, but if used at all must be used in a very dilute solution and sparingly, as it has a bleaching tendency; the paste wash fills the open pores of the skin and prevents the glaire from running away through the pores, and the glaire supplies the adhesive agent necessary to effect a binder of leather and gold.

Glaire is best painted into the traces of a blinded-in impression with a small camel's-hair brush. Leather should be given two coatings of glaire to attain the best results. The first coating acts as a filler, or size, and may be applied the day before a binding is to be gold-tooled, but the final coat of glaire should be applied not long before the gold tooling is done. The glaire for the first coat should be flowed into the impressions until they are completely filled, though it should not be allowed to extend beyond the outlines of the tooled impressions, for it will leave a grayish film on the leather. The second coat of glaire should not be so generous — only enough should be used to coat the tracings

thinly. It must be painted on evenly and should be applied continuously.

Before laying the gold, the glaire should be dry enough so that it is not "tacky." That is, when tested with the finger it should not feel sticky For some leathers, especially those dyed red, a fresher preparation of glaire is needed to produce solid gold tooling than is needed for other leathers. All dry leathers must be tooled while the glaire is quite fresh. As the tooling progresses, an experienced finisher will be able to determine whether to let his glaire dry more, or less, before laying the gold

When the glaire is sufficiently dry, the oiled tampon is lightly passed over and a little beyond the tooled impressions, and pieces of gold (laid double) are taken up one by one on the gold lifter and are laid over the impression to be tooled. As each piece is freed from the gold lifter it is lightly pressed in place and made to lie flat with the clean tampon.

At least as many at a time as five or six lines running around the whole book cover may all be glaired, laid with gold, and tooled. Usually not more than a quarter of a whole solidly tooled surface of a book cover is prepared and tooled in gold at one time How much one can prepare and tool to advantage will develop as the work progresses. It is sometimes possible to glaire and lay gold on the whole of a solidly tooled cover before beginning to tool it in gold, but no more work should be coated with glaire the second time and be laid with gold than can be tooled the same day.

Some French binders do not adhere to this rule. In fact, it has been a practice among some French extra binders to glaire, lay the gold, put a glass cover, or "cloche," over the book and leave it until the following day before tooling. They claim that a little dampness is created in this way that is advantageous for gold tooling. I have tried this method, but prefer to freshen the leather and gold-tool it the same day

Flowered tools are sighted and struck through gold as for blinding-in a design. All gouges are sighted from the inside of the curve. The book must be placed at such height as to afford the worker an opportunity to impress the tools through the gold with sufficient force to outline them clearly. The larger the tool, the greater the force needed for striking it. Small tools must be struck very lightly, or the impressions will be too deep. All the impressions outlined in a design should be of equal depth. This is one test of perfect tooling.

A tool should not be allowed to hover over an impression before being struck, for this dries the glaire and results in broken tooling; nor should it linger in an impression too long after being struck, for that dulls the gold. A quick, decisive placing of the tools gives the best results. As it is put down at a given point, pressure is progressively put on it until the opposite side of the tool is reached. Then the tool is very slightly rocked from side to side. This motion is almost simultaneous with placing the tool and should not be exaggerated or it will blur the impression. The French have an expression in connection with placing tools that is very illuminating. Speaking of striking a tool or of meeting the leather with it, they say: *Il faut le saisir* (It is necessary to seize it).

When the same tool is struck in more than one impression without reheating, as it frequently is when tooling a "diaper" design, its position in the hand should not be changed. Shifting a tool in the hand when it is to be repeated slows up the work and increases the difficulty of placing it precisely.

The heat for gold tooling is greater than for blinding-in and depends upon the leather. The drier the leather, the greater the heat required. For most leathers the tool should be heated so that when a few drops of water are put on its shank to test for heat, they will produce a lively sizzle. Heat indicated by a lazy sizzle will be sufficient for tooling on thin, new skins. The cooler the

tool, the brighter the gold tooling will be, so that a finisher must find just how little a tool need be heated in order to make the gold stick, if brilliant tooling is to be achieved This requires considerable experience

After tooling a design through gold leaf, with a piece of absorbent cotton the surplus gold is rubbed off the book into a tin box. When the box is filled, the gold is sold to a goldbeater The tooled impressions are then cleaned along the edges with the gold cleaner (Fig. 170) and the surface of the book is rubbed over with a piece of clean absorbent cotton to remove any residue of gold It may be lightly cleaned with the gold cleaner, if necessary.

If the tooling is not solid, it must be redone or patched. One glairing is sufficient for patching When the tooling is finally finished, the leather is washed off with a pure gasoline procured at a pharmacist's, and the book is stood up to dry before being put away. When put away it should always be kept weighted, as it should be when not being worked on during the process of tooling.

The cleaning of tools is even more important for gold tooling than for blinding-in. Bright gold tooling cannot be produced with dirty tools. Fine mounted emery paper must be used constantly to keep the face of tools clean, and an extra polishing on the flesher-covered pad is desirable.

Failure of the gold to stick may be due to various causes. The tool may not have been hot enough, the glaire may have been too dry or may not have been painted in with care to cover the traces, or the pressure used may not have been sufficient After the finisher has tried a hotter tool or greater pressure and has made sure that his glairing is carefully done, if the gold still fails to stick, the cause may lie in the leather itself. When dried-out, old skins have been used, the finisher will find them difficult to tool, and he will have to resort to paste-washing them a second time if necessary.

For reconditioning dried-out leather, see page 310. For reconditioning gold leaf that has become too dry to use without breaking into pieces, see page 314.

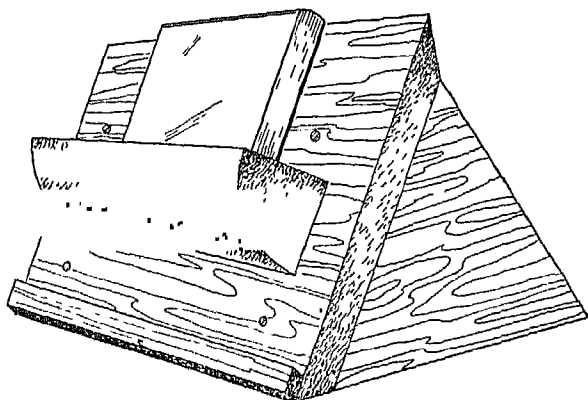



Fig 174

When the back of a book is to be tooled or titled it is screwed up in a finishing press (see Fig. 14) between two pieces of cover board For tooling lines along the length of the back, the book may be placed on the side of a finishing-press, as in Fig. 13, or on a block, such as that shown in Fig. 174.

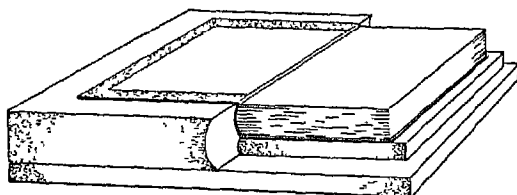



Fig. 175

The inside margins of a book are tooled with the cover open and resting on the tooling block (see Fig. 175). If the leather on the margins has been pared too thin, care must be taken in tooling not to cut through it

Not only gold leaf but silver and other metals may be used for tooling. Different shades of gold are produced by alloying pure gold with other metals, such as copper to turn it red or silver to make it paler. Gold made with alloys tends to change in color and to tarnish, so that its use should be avoided. Aluminum leaf is generally now used in place of silver leaf because it does not tarnish. However, aluminum cannot be made so thin as either gold or silver and therefore requires much greater heat to make it stick to leather. In fact, it is very troublesome to use. A new leaf, called palladium, is a better substitute for silver than aluminum. It does not tarnish, is thinner than aluminum leaf, approaches silver more closely in color, and is less metallic in substance than aluminum.

Before gold-tooling a cover that is inlaid with colored leathers, the whole surface should be washed over with a fairly heavy paste wash, regardless of what leather the book may be covered with. It must be left to stand at least an hour before being glaired.

BLIND TOOLING. The technique of blind tooling is very different from that of gold tooling. After tracing the design through the paper pattern and removing the pattern, the finisher does not blind it in. If any impressions are left very faint, they are put in with a warm tool so that their outlines may be readily distinguished, but the leather should not be dampened for this work, and none of the impressions should be deeply tooled in when the design is being put on the leather preparatory to blind tooling.

The terms "blinding-in" and "blind tooling" should not be confused, for they represent two distinctly different techniques. For blinding-in, the leather is only slightly dampened, and the tool is heated so that it is almost at the sizzling point. For blind tooling, the leather is copiously dampened and the tool is used very slightly heated.

The first thing to be done when blind-tooling a cover, after the design has been impressed on the leather through paper, is to dampen it again and again as is done before turning the grain. The object of this is to have the leather damp enough to be able to "draw color" evenly with a warm tool when it is put down on the leather. The leather must be dampened thoroughly and kept damp while tooling in blind. Until it is dampened so that when a properly heated tool is put in place an evenly darkened impression results, it has not been dampened sufficiently. Once a tool is put down with a resulting uneven color, the trace can rarely be patched satisfactorily, for the tool has pressed the leather down so flat and smooth that water will not penetrate it. The whole secret of blind-tooling a design on leather with even color is bound up in the matter of having the leather dampened to the right degree for the work and using the tool only slightly heated.

A tool must be cooled down so that the metal can be taken hold of with the bare hand. A fillet must be so cool that the wheel can be held with the bare hand for an instant without too great discomfort. This means that it must be far short of the sizzling point as used for blinding-in.

When blind tooling, one small portion of the leather at a time must be redampened and brought to just the right state for tooling. As each section is redampened to condition it for immediate tooling, the rest of the leather that has not yet been tooled should be kept damp. Since the traces of the design are faint, the frequent wetting tends to obscure the outlines and the tools must be impressed again from time to time on the untooled part of the leather as the finisher works. They must be watched and kept visible

After the impressions are blind-tooled they are polished by going into them several times with an almost cold tool. This should be done soon after the tool has been struck and before the leather under the tool has been allowed to dry out completely. To

polish lines, the fillet is pegged with a piece of wood to hold it from revolving, as in Fig. 176, or it may be held stationary with a cleaning tool (see Fig. 177). It is then pushed over the line a few

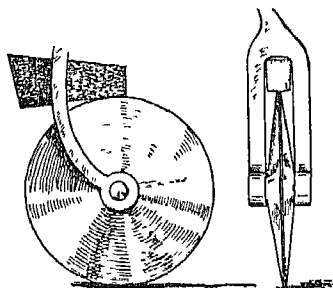



Fig. 176.

times with a "jiggering" motion, until the line is polished. The tools or fillet may be greased before polishing blind tooling, by rubbing them over a greased cloth. Any pure grease will answer for this purpose. This produces a high temporary polish to the

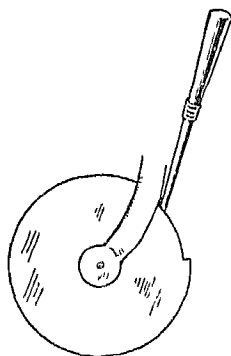



Fig. 177

tooling, but the grease soon evaporates, and I prefer not to use it, for it is a dust catcher and eventually causes the tooling to be dulled.

Some finishers get a darkened effect in blind tooling either by putting their tools into a candle flame to get carbon on them be-

fore impressing them into the design or by painting the traces with black or brown ink after they are tooled in This sort of blind tooling is, of course, far simpler to do, but the color is not permanent, as it is when "drawn" with a tool.

A leather cover must be kept so damp while being blind-tooled that it is liable to warp. To counteract the warping, the cover is polished with a round wooden form (see Fig 178) placed between the inside of the cover and the text, with the rounded side uppermost. If this fails to get the cover flat, an extra lining paper

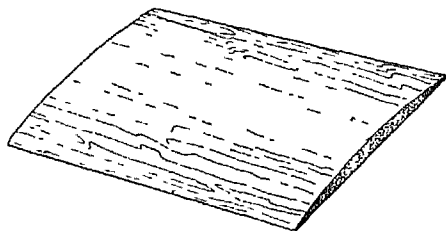



Fig 178.

is pasted on the inside of the cover. The paper should be thin and tough, such as a bond paper. It must be dampened on both sides before being pasted and then it is stretched tightly after it is applied to the cover. Covers tooled with all-over designs in gold often have to be treated in the same way.

It may be readily surmised that blind tooling when done properly is quite as difficult as gold tooling. It is simple enough just to stamp the impressions in without color, but this does not bring out the design on the leather with a rich effect. It is not a simple matter, however, to judge the dampness of leather with respect to the heat of a tool that is expected to draw an even color when impressed into the leather. When blind-tooling, the finisher faces the possibility either of drawing the color unevenly or of burning in the design, until he has had considerable practice. For this reason it is necessary to work on leather-covered cards until the technique has been mastered. This is also advisable when learn-

ing the technique of gold tooling. When both gold and blind tooling are put on a book cover, the blind tooling should be done first, for otherwise the gold tooling would be damaged by the water used in the process of blind tooling.

After a book has been tooled, its end papers are pasted back, and it is pressed with tins between its covers (see p. 227). It is then polished and should be opened as suggested in Volume I, page 194, after which it should be lightly pressed again.

Some binders varnish their gold-tooled book covers in order to preserve the tooling. They use a very fine French varnish for this purpose, but I do not advocate varnishing leather-covered books. Whether gold-tooled or not, leather bindings should be fed with a "food dressing" periodically, if they are to last, and a film of varnish over their surfaces prevents an oily dressing from penetrating the pores of the skin. It is contended that the varnish protects the leather from moisture and heat, and doubtless it does retard drying out and may prevent mildew from attacking the leather, but eventually the leather underneath the varnish will lose its oily content and will be in need of oil, which cannot be fed to it through a coating of varnish. Mildew can be controlled by frequently wiping off leather bindings

TOOLING VELLUM, SILK, AND CLOTH

TOOLING VELLUM Vellum is very difficult to tool successfully, and the least possible tooling should be done on a vellum-covered book. Vellum has a surface which shows finger marks easily and it is very slippery, so that great care must be taken in placing tools on it.

Before tooling vellum it should be washed off with clean water to remove any marks, but not much water should be used on it nor should its surface be heavily rubbed, for water and rubbing tend to destroy its luster.

The surface of vellum is very hard, and requires no paste-

washing or other preparation before being tooled The design is fastened to the book and is tooled in through a paper pattern as directed for tooling leather, though the tools must not be too hot, for vellum burns easily. Little heat and rather heavy pressure are best for tooling in the design through paper.

For gold tooling, the impressions are glaired twice, and gold is laid over them It is better not to lay much gold at a time before tooling, as gold cannot be made to lie flat on vellum and stay in place as it does on tanned and dyed leathers When the gold is laid, a slightly heated tool is used for the tooling

Glaire stains vellum easily, and if allowed to go beyond the impressions of the design it will leave ugly marks, so great care must be taken in glairing

Neither blind nor gold tooling is very successful on vellum. When blind-tooling, no water should be used, and the design is merely impressed on the vellum without attempting to draw color.

If a leather title piece is to be pasted on a vellum cover, the place where it is to go should first have the vellum surface scraped with a knife and slightly roughened. Nothing can be made to adhere to a vellum surface with paste unless it is so prepared. Before tooling on a leather title piece it should be given a paste wash After being tooled, the title piece should be wiped off with gasoline and then given a coat of fine French varnish.

TOOLING SILK, VELVET, AND CLOTH. For tooling silk or velvet with gold, a powdered glaire should be used in place of liquid glaire, which will stain the material. The powdered preparation is now commercially manufactured and can be bought where binders' supplies are sold.

When using powdered glaire the design or lines are first blinded-in with a cool tool or fillet. Powder is then dusted over the tooled impressions, and the gold leaf is cut up into small

pieces, or in strips, if a line is to be run. The tool is heated just short of the sizzling point, and the face is lightly greased by applying it to a greased pad, so that gold will adhere to it. The tool is put down on a piece of gold cut to a suitable size, and it will lift the gold from the cushion. The gold is patted lightly with a cotton tampon to bend it over the sides of the tool in order to be able to sight the tool clearly when placing it. It is then impressed in the material with a fair amount of force After all the tooling has been done, the surplus powder is brushed away. Tools must be used quite cool for this work

Velvet has a deep pile, and therefore small tools disappear in it, so that it is better to use large tools and a fairly broad fillet or letters when tooling on velvet.

Cloth may be tooled in this same way by using a powdered glaire, though a liquid glaire may also be used on cloth. When a liquid glaire is used, the whole surface of the cloth should be sponged over with the glaire, for if it is applied with a brush just in the tooled traces it will run into the cloth and make unsightly marks around the tooling. Whether dry or liquid glaire is used for tooling on cloth, the gold should be picked up on the greased tools, and not laid over the material, as for tooling on leather.

INLAYING LEATHER

Colored leather of a different hue from that of a book cover may be either inlaid into a design on the cover or onlaid over it. To inlay, the edges forming the design blinded-in on a book cover are cut on a bevel, the leather within the tooled impression is removed, and a piece of pared, colored leather is fitted and pasted into the cavity. To onlay, a piece of pared, colored leather is cut to the form of the design tooled on the cover and is pasted over it. Onlaying is less difficult than inlaying, but it is a stronger method of introducing colored leather into a design and is the method most in use for this work. Regardless of whether the

colored leather is pasted into a cutout impression or whether it is pasted over the impression, the work is known as "inlaying," and the following directions are based on the second method of working, which, though called "inlaying," is actually "onlaying."

The leather used for inlaying is first pared very thin (see p. 204). When it is to be inlaid over a design impressed by a small tool or by several tools used to build up the design, the pared leather is moistened on both sides with a small sponge dampened with water, and is put over the design. The leather is pressed with the fingers into the design until the entire outline can be seen on it It is then removed, and the leather is cut with a pair of small, curved scissors all along the outer edges forming the design It should be cut in the middle of the lines defining the outer edges. For circles and small flowered tools which have a solid outline, punches to fit the design are made of steel. These are used to cut out the leather for small tool forms. The leather is placed on a piece of binders' board, the face of the punch is put down, and the handle is hit with a hammer. The edge of the leather used for inlaying the larger tool forms should be pared all round until they show none of the grayish tone on the edge of the inlay

After inlaying leathers have been pared and fitted to a design, they are pasted and put in place. To paste the small-tool inlays, paste is spread over a slab of glass, and the inlays are put underside downward on the paste and rubbed with a paper over them. They are then taken up with the point of a folder and put in place on the design, and after the edges are adjusted, they are rubbed down firmly with a paper over them. The larger inlays are pasted individually with a brush and are put down and rubbed like the small inlays. The edges of an inlay must be worked over while freshly pasted, to make them conform to the outline and stick firmly. A pointed bone or ivory tool is used for this purpose (see Fig. 179).

When inlays are put in a border between lines they are usually

joined at the corners if the border is to go around a book The leather should be cut a little wider and longer than needed for all the strips, and it is then pared The pared leather is dampened, placed on each border segment, and defined as for small tools. To outline the lines more distinctly, the point of a folder is run along each trace. The leather is removed and is cut with a knife on a covered cutting tin. It should be cut in the middle of the traced line. The two longer strips are placed first. To measure for the proper length of each strip, one end of the strip is cut off

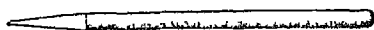



Fig. 179.

square, is then held at one end of the border to be inlaid, and is stretched somewhat. A mark is made on the strip where it reaches the end of the border opposite from that on which the squared end rests, and the strip is cut off square just short of this mark. Then the two short strips are measured in the same way, but they are cut on the marked line instead of short of it Next, each strip is marked at each end with a line which miters the corner at a 45° angle, and the strips are cut off on the marks. The longer ones are beveled on the upper side of the leather along the mitered line. The bevel should not be deeper than one-thirty-second of an inch. The shorter strips are beveled in the same way, but on the inside of the leather. The strips are now ready to be put in place.

First one long strip and then the other is pasted on the underside and left for a moment. The first strip is repasted and is stretched in place so that its two pared edges reach over onto the two short borders, in order that the short border strips will cover the beveled edges The strip is adjusted and rubbed down, and the opposite border strip is pasted, placed, and rubbed down in like manner. Next the two short strips are put down and are

stretched to overlap the pared edges of the long strips. When the edges of the strips are beveled, each short strip should be beveled to fit over the longer one without showing a ridge on the upper side.

Panels are inlaid in a manner similar to the strips in borders, but the center of the leather does not need to be pared quite so thin as the edges. The panel has a richer effect if left somewhat thicker in the center.

When a large piece of leather is inlaid, a piece of paper is pasted on the grained side of the pared leather, and is left to dry under a weight. The pattern used for tooling the large design on the leather is put over the leather-lined inlay, and the design is tooled on the inlay through the pattern The leather and paper are then cut out together, the edges of the leather are pared very thin, and the paper is removed after sponging it with a moist sponge. The large inlays are put in place and finished in the usual way. Borders may be inlaid in one whole piece by using this technique. In this way piecing at the corners is avoided, but mitered corners, if expertly done, rather add to the effect of the border.

After inlaying has been finished, the work should be covered and left to dry with a smooth pressing board and a heavy weight over it. Before the work is entirely dry, each cover may be put in the press between crushing plates and nipped. To put the book in the press for this work, a piece of heavy blotting paper is laid over a pressing board which is in place toward the top of the press, and the inside of one cover is laid over the blotting paper. A crushing plate is put over the outside of the cover, and boards are piled up over the plate. The book must be put in so that the back edge of the cover board is exactly even with the front of the board underneath it and even with the front of the crushing plate on top of it. The whole book, except for this one cover, will hang outside of the pile of pressing boards, and it must be supported (see Fig 180). The press is then wrung down, and the book is

taken out almost immediately This same method is used when the sides of books are crushed, though the book is left in until the leather has been highly polished Crushing plates are made of steel and have a nickeled surface. It must not be forgotten that an inlaid book should be paste-washed before it is tooled.

For white inlays it is better to use a piece of Japanese paper than

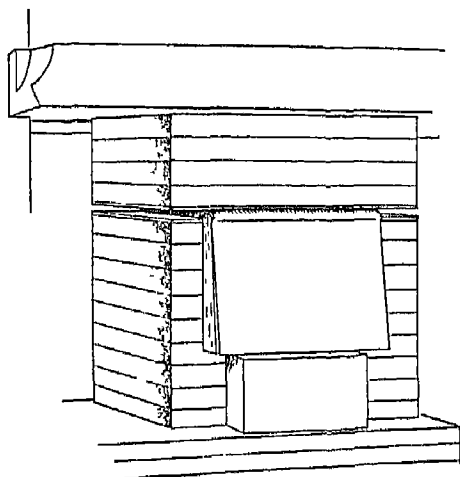



Fig. 180

leather, for most white leather is almost impossible to pare thin without wetting it, and this turns it a cream color Furthermore, when pared very thin, white leather is not opaque, and the color of the leather on the book will show through it.

Vellum cannot be inlaid, and the introduction of color into a design tooled on a vellum-covered book must be made by painting the design with a stain. After the color has dried, a coat of size should be put over it.

CHAPTER XXIV

LETTERING

Lettering on back of book. Design and Pattern Making

LETTERING ON BACK OF BOOK

LETTERING may be done on the back of a book either with single letters, each put in a handle like small, flowered tools (see Fig. 155), or with type set in a typeholder, or pallet (see Fig. 181). Lettering may also be done by using straight lines and curves to form the letters.

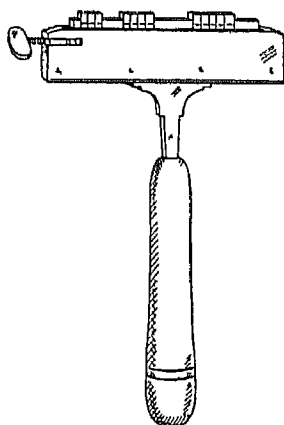



Fig 181.

Lettering that is done from a pattern made up of curves and lines in an original manner or with single letters cut on brass from a chosen model allows greater scope for artistic arrangement than that done with type set in a typeholder Not a great deal of time is saved by tooling-in a title set up in a line and held in a typeholder, except when several books bearing the same title are to be lettered. The typeholder method is a method in which the French binders excel, whereas lettering with single letters is the method most used by English extra binders, and they have

mastered this technique so that an expert workman can tool forty titles in a ten-hour day. If books are to be lettered to harmonize with modern designs, the typeholder method is too rigid.

LETTERING WITH INDIVIDUAL LETTERS When a book is to be titled with individual brass tools or with brass type, at least four or five sizes of letters should be in the binder's equipment for ordinary lettering. A model may also be chosen for special lettering, such as the Koch or Eve model or a lapidary model, and a third, or "antique," model may be added for the lettering of prayer books and missals These special models cannot usually be afforded in more than two or three sizes, for hand-cut tools are very expensive. If a binder were well equipped with specially cut hand and typeholder letters, the expense would mount to between six hundred and one thousand dollars All letter tools and type should be made of brass. Lead type is neither durable nor dependable, as it melts when put on the tooling stove in a typeholder, and it does not hold the heat as uniformly as brass.

Books that are to be kept on a shelf should always be lettered on the spine. If a book is too thin to allow for a title being put across the spine, the lettering may be run along the spine The American custom is to run such titles to read from tail to head; the English binders have the convention of running them to read in the opposite direction. I think the American custom is preferable, for when a book is standing on a shelf, a title running from tail to head is more easily read than one running from head to tail.

Before a book is titled, a pattern for the lettering should be made on paper, when individual letter tools are used or when the letters are to be formed of straight lines and curves For making the pattern, a strip of thin bond paper is cut the height of the panel to be lettered and wide enough to reach about two inches beyond each side of the back. The title and author should then be

written out exactly as they are printed on the full title page, and this copied title should be kept in view to work from as the title is being made up. The binder's memory should never be trusted, however familiar he may be with the title of a book.

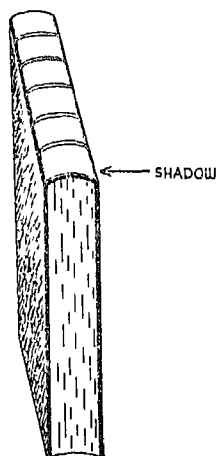



Fig 182

If the written-out title and the pattern paper strip are consulted, the binder will be able to judge fairly accurately the number of lines and the size of the letters needed for the title. When these two matters have been decided, the binder estimates how far over each side of the spine he may allow the title to run. In order to determine this distance, the book is placed on the workbench with the spine up and perpendicular to the worker. It may then be noted that a shadow is cast on each side of the spine as the light strikes it where it curves toward the sides of the book. These shadows mark the limits of the space that should be tooled, for if gold tooling were to reach beyond these lines of shadow, the gold would crack after the book had been held open several times The title would also be difficult to read. The book is marked on each side of the spine with the point of a folder where

the shadow lines occur (see Fig. 182) and the cut strip of paper is laid over the spine and is marked for width a distance equal to the width of the spine indicated by the folder marks. Lines are drawn through these marks at right angles to the length of the strip.

The next thing to be done is to space off the strip for the lines of lettering. If, for example, the book is "Art In Our Time," and this title is to be put on a rather thin octavo volume, it will be necessary to divide the title into four lines. A letter with a vertical stem or one that ends at top and bottom in straight lines like E, is chosen from the letters making up the title, the face of the letter is blackened in a candle flame and the letter is put down on paper. Spring dividers are set to the height of the letter, and this distance

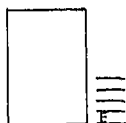
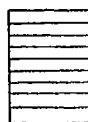
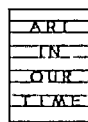



Fig 183 A. Fig 183 B. Fig. 184.

is marked off four times on the width of the strip to determine how much space is needed for the four lines of the title. The balance left on the width of the strip represents the amount of space that is available for spaces between the lines of letters and for spaces above and below the title (see Fig. 183 A). This distance is divided up with a second pair of dividers according to the taste of the binder, though the spaces between the lines of letters must be even, and the space above the title should be a trifle smaller than that left below the title It usually looks well to have the spaces between the lines of lettering equal to the height of the letters used. When the proper distances are found, the strip cut for the panel is compassed off and two parallel lines are marked with a hard pencil across the width of the strip for each of the four lines

of letters, leaving the desired spaces at top and bottom of the panel (see Fig 183 B). The letters are then put down between these lines.

To put down the letters, the paper is first divided in the middle between the two side lines marked for the width of the title, and a line is drawn to indicate this division. Each tool face is blackened in the flame of a candle, and the tools are impressed on the strip so that the letters of the title are equidistant from each other — the longer words filling the width of the space and the shorter ones centering over them (see Fig. 184).

Spacing the letters in a line will be most easily accomplished if the number of letters in the line are counted, and the center letter of the line is put down first on the line marking the center of the strip, like "r" in "art" as shown in Fig 184. From this center letter the other letters are then placed. Or if there are an even number of letters in a line, there will be no center letter, and one of the middle letters is just placed on one side of the middle line. This letter spacing is best worked out on one side of the strip before the letters are put down in the panel marked on the strip.

The author's name is compassed up for and is put down in the same manner as the title. An English title is usually placed in the second panel from the head of the book, and the author's name is placed in the panel below the title. A volume number is placed in the panel below the author's name, and the date of the edition is placed at the tail, when the edition is a valuable one. In lettering a French book the author's name is put above the title. Either both the author's name and the title are put in the second panel with a dash between the author's name and the line or lines of the title, or the author's name is put in the second panel and the title in the third one.

However, titles need not be tooled in a stereotyped fashion. Instead of putting down a title such as "Wordsworth's Poetical Works" with small letters, as in Fig 185 A, larger letters may be

used, and the words may be broken up as shown in Fig. 185 B, or in some other way. In fact, the lettering of a book should be considered as a part of the whole design of the decoration used on the sides and back of a book, and the title should be planned to harmonize with the design. Unconventional titling of books is done to advantage by drawing the letters individually and then fitting the drawn letters with straight lines and curves, in order that they may be tooled on a book. This manner of lettering is especially suitable for books decorated in an unconventional manner.

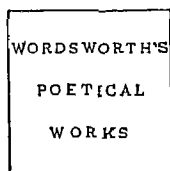



Fig 185 A.

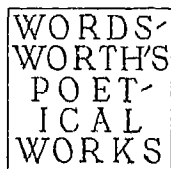



Fig. 185 B

After a pattern has been made for a title to be put on the back of a book, the book is put in a finishing press with a piece of protecting binders' board on each side. The strip containing the title is put in place over the panel for which it was cut, and when it has been carefully centered it is fastened with scotch tape onto the protecting boards covering the sides of the book. The title is then tooled through the paper, and after the paper has been removed, the leather is slightly dampened and then the title is blinded-in clearly. It is then gold-tooled like the sides of a book. Or if the title is to be blind-tooled, deep blinding-in is omitted, and the work is done as already described.

Lettering with Type. When type is used for a title, no paper pattern is made. The spacing for the lines of the title is estimated with regard for the width and height of the panel to be

lettered, then the type is put in the type pallet and is spaced according to the taste of the finisher.

There are two methods used in gold lettering done with type in a pallet. One is to impress the title on the leather with the type set in the pallet and slightly heated, after the spacing has been mapped out, then to glaire the tooled impressions, to lay gold over them when the glaire is dry, and to tool as for individual letters. The other method is to divide up the panel for the title, and indicate the divisions on a piece of paper for reference, then glaire over the whole panel with a small sponge, lay gold over it in the usual way after the glaire is dry, and mark lines for the lettering across the gold by drawing a piece of fine thread over it from side to side. The pallet is then heated and the letters are impressed over the gold.

It is no easy matter to run the type in a pallet over the round back of a book and make a straight line of the lettering. The French finisher places the book in the press at right angles to him, sights the line of type from the heel of the type, and runs the pallet across the back of the book on a line parallel with him from right to left The English finisher usually places the back of the book parallel with him, sights the type from the line at the head of it, and guides the pallet across the back of the book. The American finishers usually use the French method. After a few trials at lettering with a pallet, a worker will soon find which of these ways is the easier for him to use.

Unfortunately, explanations are of little avail in helping a beginner to learn titling. He must learn this art through practice. The most valuable hint I can suggest for keeping a line of type straight across a book is that the worker must not bend over the work, but must stand erect before it, with both feet planted firmly on the floor some distance apart Titling is an operation in which correct stance is of the utmost importance.

DESIGN AND PATTERN MAKING

Design is the arrangement of some form or forms within a given space. The empty spaces in a design often count for as much as the filled spaces, and the manner in which spaces are filled or left empty stamps the design as formal or informal, stereotyped or freely created.

A design to be tooled on a book cover must be of such a nature that it admits of reproduction on the cover by means of engraved tools, for this is the only way tooling can be done on a book. In consequence of this mechanical limitation, a very special type of design must be made for a tooled cover; the artist creating it is restricted and is unable to give his imagination such free scope as the artist who is designing a cut-leather cover for example. There is no such freedom possible in any type of book cover designing as there is in painting on canvas or etching on a copper plate. However, this does not mean that the artist making a design for a book cover must confine himself to the same symmetrical arrangement of repeated tool forms and produce cover designs like those of the traditional past.

Artistic arranging is not creative designing, and tool forms, however beautiful they may be, cannot be expected to do the work of the designer. They can merely work for him. The designer must conceive a design and utilize his tools to serve the purpose of carrying out a definite scheme of decoration that has been created through his imagination.

There are two general types of design for book covers—symmetrical and unsymmetrical. Symmetrical designs may be built up with a repeat of tool forms at regular intervals, as in "diaper designs" (see Figs. 186, 187), or they may be created by drawing some symmetrical form and repeating small tools in conjunction with this form, in order to carry out a decorative scheme (see Fig. 188).

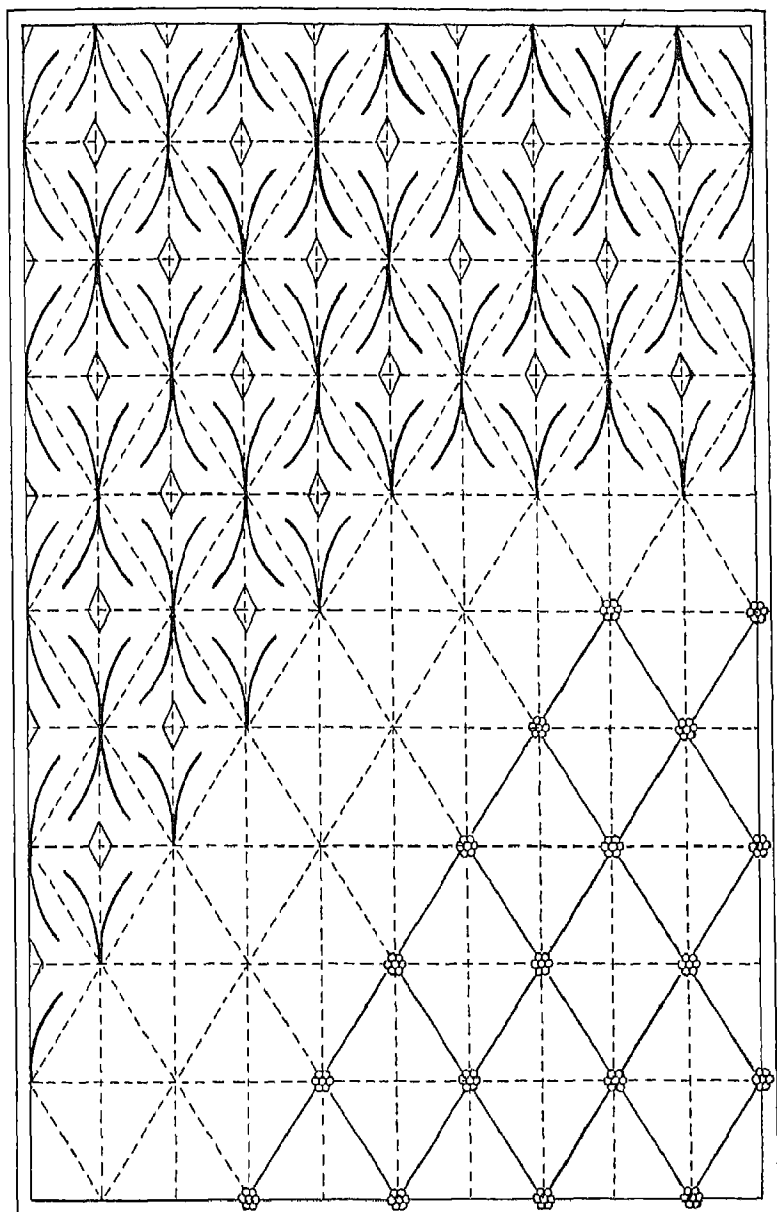



Fig. 186　　　　　　　　　　Fig 187.

A simple diaper design is the least creative of any type of design, but it serves well enough for decorating the covers of a prosaic book, when it is arranged as in Fig. 186. The type shown in Fig. 187 may be used on a leather doublure with good effect. The construction lines are shown in Fig. 186 by broken lines, and these lines are not reproduced on a book cover. However, in Fig. 187 the lines are utilized as a part of the design, as shown when they are made into solid lines.

To make the paper pattern for a symmetrical diaper pattern design, a piece of bond paper is squared to the exact size of the book cover and is then compassed up and divided equally in width and length after the desired width for a border has been marked off. Lines are drawn diagonally across the paper through the marks that divide it; thus diamond-shaped segments are made. A segment of the paper is decorated by arranging tool forms in it with tools blackened in a candle flame, the paper is folded in half and creased both in length and in width, and the same tool arrangement is repeated in each diamond on one quarter of the folded paper. The decorated quarter is then folded over, and the back of the paper on which the design has been marked is rubbed with a folder so that the imprint of the design is transferred to the opposite side of the paper. The indicated outlines are made clear by impressing blackened tools into them. The half-made design is folded over onto the other half of the paper and is transferred to it and made clear. A great variety of tool arrangements may be used for decorating the diamond-shaped units.

A paper pattern for symmetrical design such as that shown in Fig 188 is made in a manner similar to that used for a diaper pattern. However, instead of decorating set spaces like diamonds and then repeating the motif, an outline is drawn freehand, the paper is folded into four parts, and after one-half of the paper pattern is decorated, the design is transferred and repeated on the other half of the paper.

AWAKE FOR MORN
ING IN THE BOWL OF NIGHT HAS
FLUNG THE STONE
THAT PUTS THE STARS TO FLIGHT

Fig 188

In developing the design shown in Fig 188, the procedure is first to decide the type of design and the tools that are to be used. Then a border is compassed off in a suitable proportion to the size of the cover, and a rough sketch of the decoration contemplated for the center panel is made on a separate paper. The paper pattern is folded into quarters, and the curved outline of half the design is drawn accurately on one side of the paper pattern. The paper is folded over, and the design is transferred onto the other side, in order to get the effect of the completed form. Changes are made until the desired outline is arrived at, and then the small joining curves are drawn.

When the tools are assembled, the designer begins to let his fancy play, and he creates the finished design by filling half the space to be decorated, with curves and tool forms, and then transferring that half to the other side of the paper pattern. He finally fills in, here and there, spottings of tools, in order to bring the whole design together. This design is made by using only three set tools, one a leaf, another an oblong solid tool used to form the bunches of grapes, and the third a spiral tool to finish the ends of curves. The design for the spiral tool has to be drawn by the designer and given to a tool cutter to cut. The lettering is afterwards blocked out on paper and is put down in the border with blackened tools.

Unsymmetrical designs are of the type in which set tool forms are generally dispensed with, and all the decorative forms in the design are drawn freehand (see Fig. 189). Symmetry is, of course, found in the component parts of the design, but balance is substituted for symmetry in the general scheme of decoration. For a design of this type a paper pattern of proper size is cut, and the finished drawing is drawn on the paper pattern with a pencil.

By using colored inlays and by using blind tooling with gold tooling, a variety of effects can be produced. If the same design were tooled in gold on a book cover, and then blinded-in and in-

laid in color on another cover of the same size and color, it would appear like a different design on the second cover, unless it were closely inspected.

Extra binders design most of their own tools (except period tools) and have them cut for their special use. All flowers and other forms must be conventionalized, because otherwise they give a restive appearance to the design when they are often repeated. It is well to have the same tool forms cut in different sizes The drawing for a tool must be made quite large in ink; the tool cutter will reduce the drawing and cut the tool in any sizes specified. Some of the tools cut in outline should have punches made for them so that they may be inlaid. The tool cutter will make these upon request.

An extra binder should have training in the art of design. Unless he has learned to draw and has been steeped in the underlying principles of design, he cannot hope to produce decorated books of artistic merit A basic training in this art is an absolute requisite for the expression of ideas or fanciful conceptions in a manner suitable for decorating book covers.

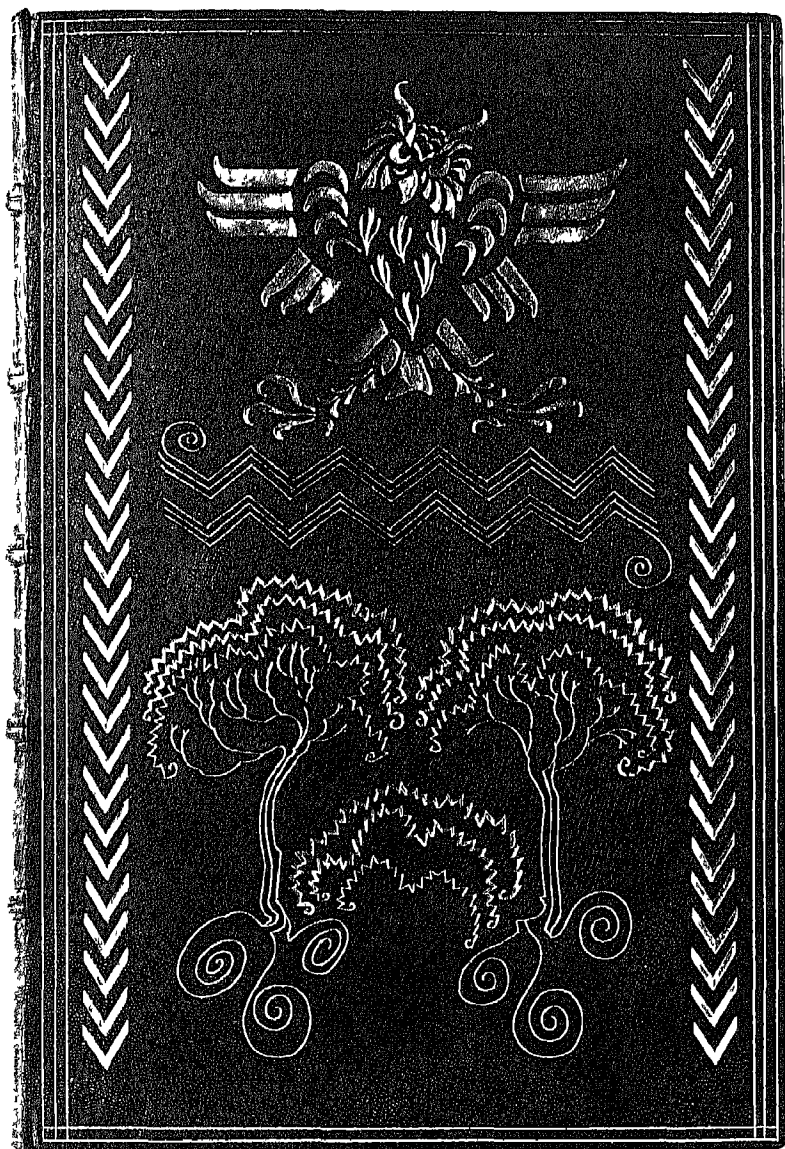



Fig 189 Design by Arthur Rackham on Midsummer Night's Dream manuscript

Courtesy of the Spencer Collection, The New York Public Library, New York, N Y

GLOSSARY

GLOSSARY

All-over design A design planned as a decoration to cover an entire side of binding, in distinction to a cover, center or border design, whether made up of a single motif, different motifs or a repeated motif

Anchored. A head or tailband is said to be anchored when it is fastened to a book by a thread conducted from the front to the back of a section

Armenian bole. A red chalklike mineral substance used in preparing edges for gilding.

Arming press. Another name for blocking press A press used for stamping designs on book covers The name was derived from its use in impressing armorial bearings on the sides of books

Art mat paper. A kind of highly glossed paper used mostly for printing illustrations from half-tone plates

Backbone Same as Spine

Backing The process of shaping the back of a book and forming a joint on each side of the back after the sections have been glued together

Backing a board. Cutting a straight edge along its length.

Backing board Wedge-shaped board beveled at the top edge used to form a joint when a book is being backed

Backing hammer. A hammer used for rounding and backing books.

Band nippers A metal implement used for nipping up leather over the bands of a book when covering it.

Bands The covered cords or other material across the spine of a book which divide it into segments

Bandstick A stick used over the back of a book during the process of covering for the purpose of smoothing down the leather between the bands.

Bandstrip A strip of material which forms the basis of a head or tailband

Basil. Tanned sheepskin used for cheap bindings.

Bead The twisted stitch formed in headbanding

Beating hammer. A short handled hammer used for beating the text of a book

Beating stone. A stone or slab of iron set in a frame filled with sand, on which books are beaten.

Bench-made. Any work done on the workbench by hand

Bench shears. A species of large shears used for cutting bookboards, sometimes fastened to a workbench

Binder's board A composition cover board.

Binding "en gist." A Bradel binding

Bleeding Cutting into the print of a book.

Blinded-in A design is said to be blinded-in, when it has been impressed on a book cover with heated tools.

Blind tooling Impressing heated tools on leather by hand, without the use of gold Sometimes referred to as antique.

Block book A book printed from blocks of wood having the letters or figures cut on them in relief.

Block papers Papers printed from blocks of wood or metal on which a design has been cut or engraved.

Blocking The process of stamping book covers. Same as Stamping.

Blocking press. Another term for arming press.

Boards

1. Wooden or composition pasteboard covers used on the sides of books.
2. A general term used by binders for various stiff lining and mounting materials.

Bole. A reddish mineral used as a base on book-edges preparatory to gilding them

Bolt. The folds in the sheets of a book at head and fore-edge

Book covers.

1. A term applied to the covered sides of a book
2. Protective covers of soft leather, like doeskin, sewed fast to a leather covered book. A custom in use during the Middle Ages and early Renaissance.

Bookmarker A ribbon fastened to a book to be utilized for marking a place when reading. Usually put in prayer books or books of devotion, by a binder.

Book-square The projection of the book board over the edges of the text.

Books in sheets Books which come from the printer in unfolded sections

Bound book A covered book the sections of which have been sewn around cords or some other material, the ends of which are laced through the cover boards

Bound flexible A book is said to be "bound flexible" when its sections are sewed around cords which are laced into its cover boards

Boxed book A book is said to be boxed when it is in a covered case or book box.

Bradel binding A type of temporary binding said to have originated in Germany, and first adopted in France by a binder named Bradel Known in France as "cartonnage à la Bradel."

Brochure. A sewed book with a paper cover

Burnisher. An agate or bloodstone set in a handle for burnishing leather

Burnishing The act of applying a burnisher to a surface in order to polish it

Burr A term used in bookbinding with reference to a knife to signify a turned-over edge.

Canceling Cutting out a leaf of a book and substituting another leaf in order to correct a misprint or to make an alteration

Cancels Pages printed to substitute for pages in a book which contain errors or require alterations.

Carton bleu A species of French cover board

Cased book A book which is held to its covers, or casing, only by means of pasted down end papers, which are sometimes reinforced

Casing Cover of a book made separately and pasted to the book by means of end papers

Casing-in Pasting a book into its casing

Catch stitch A stitch made to fasten one section to another when a book is being sewed. Also called chain stitch.

Catchword. A word printed at the bottom of a page to denote the first word on the following page

Chain lines The narrow numerous lines in a sheet of paper made by wires in the "mould"

Chain marks Same as chain lines.

Chain stitch Same as catch stitch.

Chemise A cover or jacket used to protect a binding.

Chipboard A thin hard-surfaced grayish board used in bookbinding mostly as a lining board.

Cloth board

1 A pressing board having a metal flange on its edge used to define a French joint when casing-in

2. A binders' board.

Collate To examine the signatures after a volume has been folded to ascertain whether the pages are in proper sequence

Colophon. A paragraph put at the end of a written or printed book, con-

taining information as to the identity of the scribe or printer, place of origin, date of printing, and sometimes other related matter In extensive use until after about 1570 Sometimes referred to as an imprint

Commercial binder A term used to denote a binder who turns out publishers' editions in "casings," using machinery for the work Better termed a machine binder

Concertina fold An accordion-pleated fold

Cords The material around which the sections of a book are sewed.

Corner knife A specially shaped knife used for cutting leather at the corners of a book cover during the process of covering a book.

Cover boards. Same as "Boards" 1

Cropped A book is said to be cropped when its margins have been injured in cutting

Cropping Cutting the edges of a book beyond the shortest, or proof, sheet

Crushed grain. Grain of leather that has been flattened with pressure between metal plates.

Crushing plates. Nickeled metal plates used for crushing the leather sides of books

Cut-edge book A book the edges of which have been cut off smoothly

Cut in-boards When the edges of a book are cut after the boards are laced on, the book is said to be cut in-boards.

Cut open. A finishing tool is said to be "cut open" when the design on its face is defined by lines.

Cut solid A term applied to finishing tools the faces of which are of solid metal, sometimes with line veinings, in distinction to tools cut with the designs formed by lines, or cut open

Cutting board.

1 A board (usually of hard wood) on which cutting is done.

2 A wedge-shaped board used when cutting the edges of a book

Cutting press An implement used for cutting book boards or the edges of books by hand

Deckle edge. The rough or irregular edge produced on a sheet of paper when in process of being made Especially characteristic of handmade paper.

Diaper design A design in which a motif is frequently repeated at regular intervals, usually in lozenge forms.

Dividers A steel instrument having two adjustable prongs used for dividing spaces

Divinity calf Dark-brown calf used on religious books and tooled in blind.

Doubled tool. A tool is doubled when in placing it a second or third time it is not placed exactly in the first impression.

Doublure The lining of silk, leather or other material on the inside of book covers

Drawing color A term used in blind tooling when the color of the leather binding is darkened by an impressed tool.

Dummies False or trial objects made up in models of real objects

Duodecimo A term used in reference to a book made up of twelve leaves to a section Same as "12mo"

Edge-rolled When the board edges of a leather-covered book are tooled with an engraved roll they are said to be edge-rolled

Edging knife A knife used to pare the edges of paper or leather

End papers The extra unprinted papers placed at the beginning and the end of a text, a sheet of which is pasted down on the inside of the front and the back book covers

Extra binder A hand binder who uses the best materials and employes the soundest methods of construction and who usually decorates each binding with a design especially made for it

Extra binding A term used to denote a binding done by hand with especial care

Face. The face of a tool is on the end of the tool on which the design has been cut

False back A hollow back

Fanning out Manipulating a pile of book sections, sheets of paper, or boards so that each unit is exposed under the other a short distance along one edge

Fanning over Same as fanning out

Fillet A cylindrical revolving metal finishing tool mounted in a wooden handle and used for running lines or designs on a book cover Sometimes called a roulette or a roll

Filling in. The process of leveling surfaces by affixing a material of suitable thickness between them

Filling-in boards Any thin paste boards used to make surfaces level

Finishing All the work done on a binding after it has been covered in leather The workman who does this work is called a "finisher"

Finishing press A small lying press used for holding a book while it is being tooled, and for some other operations in bookbinding

Finishing tools Tools engraved with a design on their faces, used for tooling designs on book covers.

Flesher leather The cutoff part of a split skin

Flexible glue. Glue made by cooking animal glue with water and glycerin or some other softening agent.

Flyleaves. All the free leaves of an end-paper section, but when used in the singular, the term denotes the uppermost free leaf of the section next to the cover board

Folder A shaped piece of bone used in the process of folding sheets and for other binding processes.

Folding stick. A long thin polished piece of wood with rounded ends and sides, used for folding "books in sheets"

Folio A book made up of sheets folded only once

Fore-edge. The edge of a book opposite the folds of the sections.

Forel. An inferior kind of parchment prepared from split sheepskins.

Format In bibliographical parlance, a term used to indicate the number of times the original sheets have been folded to form the sections of a book.

Forwarding The branch of bookbinding that takes the book after it is sewed, and completes the binding through the covering process. The workman is called a "forwarder."

Foxed A sheet of paper is said to be foxed when small brown spots appear upon it The spots are called "foxing"

French chalk A species of soft chalk (used by binders for removing grease spots).

French corner A type of covered corner on a half binding fashioned in such a manner as to protect the corner without being visible on the side of the binding

French joint A joint formed by hinging the cover board a short distance away from the back of the book in order to permit it to swing freely.

Frottoir. The French name for a wooden stick with a concave end used to clean glue off the backs of books. No English equivalent

Full-bound. When the entire back and sides of a book are covered with leather the book is said to be full-bound.

Full cloth. A full cloth book is one entirely covered with cloth.

Full gilt A term applied to books with all edges gilded.

Full title page The page bearing the complete title of a book (sometimes amplified), the author, usually the place of origin, publisher, date, and

often the printer's name and address constitutes the full title page of a book printed in recent times

Gathering.

1. A section or signature of a book.

2. Collecting the sheets when folded and placing the sections in sequence

Gauffered edge A book-edge decorated with a design tooled in over the gilded edge, and frequently colored

Siggering a tool A term used to describe a back-and-forth motion of a tool in the process of blind tooling.

Gilder The workman who gilds the edges of books

Gilder's tip An implement for lifting gold leaf, which has a grouping of soft hairs laid flat along one of its edges.

Gilding The process of burnishing gold leaf on the edges of books

Gilding boards Boards similar to cutting boards which are used when gilding the edges of books.

Gilding press A screw press used for holding a book when in the process of gilding

Gilt all round When all three edges of a book have been gilded, the book is said to be "gilt all round"

Glaire A liquid deposited from the beating up of white of egg and vinegar or water used to size tooled impressions before laying on gold leaf for gold tooling, and for sizing book-edges before gilding

Glairing Painting in glaire over a blinded-in design preparatory to tooling the design "in gold"

Gluing up A term applied to the process of gluing the sections of a book together preparatory to backing

Gold cleaner An implement for removing the surplus gold which extends beyond a gold-tooled impression

Gold cushion A cushion on which gold leaf is laid out for use in gold tooling.

Gold knife. A knife for cutting gold leaf

Gold leaf A thin leaf of gold beaten out of a block of gold.

Gouge A finisher's tool that forms a segment of a circle.

Graining boards Wooden boards with an artificial grain cut on their surface, used for producing a grained pattern on smooth leather such as calf.

Graining plates Metal plates used in place of graining boards.

Grain of paper. The grain of paper is constituted by the main direction taken by its fibers

Grooved boards

1. Cover boards with grooved edges, peculiar to Greek bindings.
2. Cover boards that are cut out to receive the slips of a book

Guarding The process of pasting strips of paper over the folds of the leaves of a book.

Guards Strips of paper on which plates are mounted or with which sections are mended. Also, narrow strips of paper sewed with a book to compensate for the thickness of inserted plates

Guillotine cutter. A paper and book cutting machine built and operated like a guillotine.

Guinea edge A style of tooled book-edge, made with a fillet which has an engraved pattern similar to the edge of an old guinea coin

Half binding A book covered over the back and partly on the sides with leather, and with some other material on the sides, is said to be a half binding

Half title, or bastard title An abbreviated title which precedes the full title page of a book.

Hand letters. Letters used by a binder individually, as opposed to letters used together in a typeholder.

Hard-sized paper Paper liberally sized.

Head. The head of a written or printed book is that part above the first line of writing or printing

Headband. A silk-, linen- or cotton-covered band stretching across the head edge of a book and resting along the contour of the back of the book.

Headcap The shaped folded piece of leather that covers the headband

Heel

1. A term applied to the end of a knife blade which is opposite the point.
2. As applied to a finishing tool, the term signifies the lower end of an engraved figure or design.

Hinge. The material that is used to fasten the text of a book to its board covers.

Holing-out A term used to signify the process of punching holes through the board covers of a book to receive the sewing cords.

Holing-out block. A lead block placed under bookboards when holes or slits are being punched through them.

Hollow back A type of false back of hollow construction affixed to the back of an uncovered book.

Imposed Type set up in page form is said to be imposed when it is arranged according to some specified scheme on an imposing stone, and is locked up in a chase or frame

Incunabula In bibliography, books printed in the infancy of the art, or "cradle books" The term is confined to books printed before 1500

Inlays Pieces of colored leather or other material set into a figured pattern, a border or panel Now used interchangeably with "onlays"

Inlaying a plate A plate is said to be inlaid when its beveled edges are fitted and pasted to the beveled edges of a piece of paper or cardboard cut out to its size

Inset The pages cut off a sheet in folding, and placed in the middle of the folded sheet

Inserts Maps and other similar matter inserted in a printed text

Interleaving blotting paper Blotting paper as thin as a medium-heavy sheet of paper

Jaconet A kind of material similar to cambric used by English binders to line up the backs of books

Job binder A binder who does mostly hand binding for the trade

Joint The groove formed along the back of a book to hold the cover board.

Justification A word used to signify the act of checking the pages of a book to see that the printing is "in register"

Kettle stitch. The same as catch stitch

Knocking-down iron An iron block on which tapping or striking with a hammer is done in the process of binding a book.

Knocking up. A term applied to the operation of squaring the back of the sections of a book to the head of the book.

Koch letters A model of letters designed by Rudolph or Paul Koch of Germany.

Kraft paper A trade name for a special kind of heavy brownish paper

Lacing-in The operation of drawing the frayed cords, or slips of a book through the bookboards in order to fasten them to the book.

Laid lines The broad lines seen through a sheet of paper running across its width, made by the heavy wires in the bottom of the "mould"

Laid on. Gold leaf is said to be "laid on" when it has been applied over a surface to be tooled

Laid paper Paper made in a mould in the bottom of which heavy lines of wire are fastened

Lapidary letters A model of letters taken from inscriptions on stone.

Law calf Uncolored calfskin usually used for binding lawbooks

Lay cords The cord loops on the bar of a sewing frame to which the sewing cords are fastened

Laying gold Applying gold leaf over a surface.

Letter tools. Tools on the faces of which letters are engraved.

Library binding A special type of binding for books in a public library, constructed to endure hard wear.

Limp binding A binding the covers of which are flexible

Lined-down end paper An end paper the first leaf of which has had a piece of material entirely affixed to it.

Lining papers.

1. End papers that are pasted down on cover boards.
2. Papers used for lining purposes

Lining up. Affixing one surface to another.

Lithographic block A block of a special variety of stone used in lithography.

Lying press A large, horizontally lying screw press used for holding a book for backing, edge gilding, and other bookbinding operations.

Make-up A term loosely used to denote the format of a book, as well as to refer to the arrangement of the printed matter on a page.

Marbled paper Paper that has had a colored pattern put on one surface by the process of marbling

Marbling The art of veining a surface by floating colors on size in a design and transferring the colored design to leather, paper, or book-edges

Margins

1 The unprinted spaces around the written or printed text of a book
2 The turned-over leather or other covering material on the inside of book boards

Millboard A species of brownish cover board made in England from rope or cordage

Moulding saw A saw used by carpenters for cutting joints. Sometimes called a tenon saw.

Mount A piece of material on which anything is mounted, or affixed

Mounted plate A plate that has been affixed to a sheet of paper or to some other material

Mounting. Affixing an entire surface of a plate or similar object to some material, or one material to another

Newsboard. A thin gray board used in bookbinding mostly as a lining board.

Nicking corners A term applied to cutting the corners of a bookboard which rest near the ends of the head and tailbands

Nipping A pressing of only momentary duration

Nipping press. A small iron screw press used for light and quick pressing.

Nipping up. Compressing the leather over the cords of a book with band nippers to form the bands

Oasis-goat. A term used to designate a leather made from a goat inhabiting the region of the Cape of Good Hope

Offset The printing in a book is said to have offset when the ink on one page leaves a mark on the opposite page. Same as setoff

Ogee tool A double-curved finishing tool sometimes in floral outline.

Onlays Pieces of thin colored leather or other material pasted over an outlined tool form, border or panel. Usually referred to as "inlays."

Overcasting An operation in sewing, by which the leaves of a section are bound together by thread Sometimes called "whipping" or "whipstitching"

Oversewing The same as overcasting

Pagination The numbering of the pages of a book.

Paging Going through the text of a book, and inserting any missing page numbers.

Palladium An amalgam leaf resembling silver leaf, used in tooling bindings

Pallet A brass or steel tool used to make lines or designs across the back of a book. Also, another name for a binder's typeholder

Pamphlet A term applied to a book of a single section, issued in paper covers.

Panel The space on the back or side of a book bounded by joined lines.

Paring Thinning down leather or paper with a paring knife

Paring knife A knife used for paring leather or paper

Paring stone The lithographic stone block on which leather is pared

Paste wash Paste thinned with water used for sizing leather

Peel. A thin stick with a handle used by papermakers for hanging up sheets of paper to dry

Pencil A small camel's-hair brush used by a binder for glairing

Plain binding. The type of binding usually turned out by a job binder, with little or no decoration.

Platen A large flat surface in the top of a press that is brought down by a device above it to effect pressure is called a platen

Plough The wooden implement equipped with a knife used by hand binders for cutting edges of books in a lying press

Plough knife. A knife fastened into the base of a cutting plough for cutting boards and edges of books

Polisher A steel implement used to polish the leather covers of books

Press A term applied to several types of implements used in bookbinding for their holding or pressing capacity

Press cheeks The tops of the two wooden blocks of a press

Press jaws The facing edges of the two blocks of a press

Press pin A small iron bar used for manipulating the screws of a lying press.

Pressing board A wooden board used for pressing books

Proof. The leaves of a book left uncut by a bookbinder which prove that the margins of the book have not been cut deeper than one or more uncut pages. Formerly called "witness."

Protection sheet. A sheet fastened to the end papers of books, during the process of forwarding, to protect them

Pulled A book is said to be "pulled" when it has been cut away from its covering and all its sections have been freed from each other

Punch. The indentation of the type on a printed page.

Quarto A book made up of groups of four leaves, or eight pages

Quire. A word formerly used in bookbinding to denote a "gathering" or a "section."

Redboard An unsized, thin, supple board colored red and having a quality similar to blotting paper

Register

1. A list of the signature numbers or letters in a book. Usually placed at the end of the book.

2 In a printed book when the lines of print do not fall directly over each other the printing is said to be "out of register."

Register in truth. In perfect register

Register ribbon Same as bookmarker.

Repeat design. A design made up of a repeated motif.

Roan A trade name for sheepskin tanned in sumach.

Roll Same as fillet Called by French binders "roulette"

Rolling machine A machine with revolving cylinders used to flatten the printed text of a book.

Rough-gilt A book is said to be "rough-gilt" when its edges have been gilded before the book is sewed

Roulette Same as fillet or roll

Rounding a book A term applied to a process which consists in forming the back of a book into a convex shape

Russia leather A leather tanned with willow bark, dyed with sandalwood, and soaked in birch oil.

Saddleback A rounded back

Sandpaper blocks Blocks of wood to which sandpaper is affixed

Sawn-in. A book is sawn-in when the back of the sections are sawed through for sinking the cords in sewing

Seasoned boards Bookboards that have been lined up with paper and kept under a heavy weight until they are thoroughly dry

Secondary bevel A narrow extra bevel put on the cutting edge of a knife

Section A term applied to each unit of folded leaves comprising a book

Semis, or Semée. A term meaning sprinkled, borrowed from heraldry by the bookbinder to denote a type of design in which small tool forms are placed over a surface at regular intervals

Setoff. Same as offset

Setting a headband Gluing it to the edges of a book

Setting the squares of a book cover Adjusting them to an even width

Sewed all-along A book is said to be sewed "all-along" when the sewing thread runs through each section from one kettle stitch to the other

Sewed two-on When a book is sewed in such a manner that each section is fastened to another with the sewing thread running through the sections at every second cord, the book is sewed "two-on"

Sewing bench A wooden appliance composed of a large flat board, called a "bed," and two upright screws connected by a bar, used for sewing a book by hand Sometimes termed a sewing frame

Sewing cords A term applied to the cords, tapes or other material around which the sections of a book are sewed.

Sewing frame Same as sewing bench.

Sewing keys Metal pronged instruments used to secure the cords, or other material around which the sections of a book are sewed, to the bottom of the sewing frame.

Sewing stick A weighted stick of wood used to knock the sections of a book down firmly when they are being sewed together.

Sheet. The full size of paper on which written or printed pages have been imposed, which when folded becomes a section.

Signature The letters or figures placed under the foot line of the first page of each section of a book to indicate the sequence of the sections. The word is also used synonymously with section

Signet The French binder's term for register ribbon

16mo, or sextodecimo This term is applied to a book made up of folded sheets containing sixteen leaves or thirty-two pages, to a section.

Size. A name given to any coating preparation that tends to make a surface impervious to penetrating agents.

Sized paper Paper that has had a coating of size put on its surface or in the pulp of which it was made

Skinned A skinned surface is a pasted surface on which the paste has been equalized by being rubbed over through a piece of paper

Skiver. A split sheepskin.

Slipcase A bookcase with open front edges. Also called a slip cover

Slip cover. Same as slipcase

Slippery book A book the sections of which are not held together firmly

Slips The frayed ends of the cords over which the sections of a book are sewed.

Smooth-gilt. A term applied to the edges of a book that have been gilded after the book is cut in boards

Soft-finished paper Paper made with an unpolished surface.

Solander case. A closed bookcase with a removable top into which a book is placed from tail to head

Spine. A term used to designate the covered back of a book on which the title is usually lettered. Sometimes called the backbone

Split-board book A book with cover boards made of two boards glued together

Split skin. A skin that has had a part of its undersurface split off

Spring dividers Dividers the two prongs of which are connected by a threaded rod on which a threaded nut operates for opening or closing the prongs.

Sprinkled edge. A book-edge that has been covered with a sprinkling of color or colors.

Squares The portions of the boards of a book that project beyond the edges of the text.

Stabbed binding. A binding that is held together by cord laced through holes stabbed along its back edge

Stamp. In mediæval times, a piece of metal engraved intaglio, used cold, for impressing a design on a surface either by hand or by means of a press. At the present time, a piece of metal with a design cut either intaglio or in surface outline, and impressed heated, by means of an arming or blocking press

Stamping In mediæval times, impressing an unheated, engraved stamp on a surface either by hand or by means of a press In modern times, impressing a heated, engraved stamp on a surface by means of an arming or blocking press.

Standing press A heavy, fixed press worked by means of a cogwheel, lever or by some other means, used for pressing books

Started When the leaves of a book push out beyond the others because of too loose sewing or too rough usage they are said to have started.

Straightedge A metal ruler

Straight-grain leather A leather that has been dampened and rolled, or "boarded," to make the grain run in straight lines An innovation accredited to Roger Payne

Stringing up A term applied to fastening cords or their substitutes to a sewing frame

Super A kind of meshed material used to line the backs of books.

Tacky A term used in bookbinding to mean sticky.

Tail. The tail of a book is the end opposite the head

Tailband A band on the tail edge of a book woven over with silk or linen thread by which it is fastened to the book.

Tampon As used in bookbinding the word signifies a piece of absorbent cotton or cloth screwed up at one end and made flat at the opposite end.

32mo A book made up of sheets of paper folded in thirty-two equal parts is said to be made up in a 32mo format, and is commonly designated as a 32mo edition.

Three-quarter binding A binding similar to a half binding with a greater proportion of leather on its sides.

Thrown out. A page or map is said to be "thrown out" when it is guarded so that it may be pulled out to lie outside of the fore-edge line of the text.

Thumb case A bookcase the open sides of which are cut out in a small thumb-shaped curve.

Tipping, or Tipping on A term to denote the fastening of one material to another by pasting the material only at one edge

Title piece A colored leather label, usually pasted on the back of a binding, on which the lettering of a book is done.

Toe The toe of a knife is the pointed end of the blade

Tooling The art of impressing a design on leather or some other material by hand, with heated tools.

Tools The name applied in a specific sense to the engraved metal bookbinder's tools with wooden handles which are used by hand, heated, to impress a design on a surface

Tooth burnisher A curved-surface burnisher used by illuminators and edge gilders.

Top centered Placed above a center vertically, and centered horizontally

Tranchfille chapiteau A type of double headband of French origin

Trimmed-edge book A book the edges of which have been here and there cut off to make them less irregular.

Trimming Cutting off only a little

Trimming board A board on which the pages of books are cut to a desired size

Trindles Metal bifurcated plates used in cutting the fore-edge of a book with a plough

Try square. A mechanically perfected instrument used for squaring edges

Turn-in The leather that is turned over the edges of a cover from the outside to the inside

Turned grain Leather that has been dampened and has had its grain turned over with an agate polisher is said to have a turned grain

Turnover Same as turn-in

12mo The same as duodecimo.

Tying-up boards Boards used to tie up a binding when the leather on the spine fails to adhere firmly.

Typeholder. A metal implement for holding type, used in tooling titles on books. Sometimes called a type pallet

Type pallet. Same as typeholder

Utility knife. A name given to a knife used for various purposes in bookbinding

Vellum A calfskin prepared with lime, and not tanned like leather

Vellum binder A term used in England to denote a binder of account books, notebooks, and office stationery, etc

Warping A process in bookbinding, usually applied to a cover board, which turns it from a flat to a convex or concave form

Warping paper. A paper pasted to a surface usually for the purpose of counterwarping it

Waste

1 Fragments of old books or spoiled and excess sheets of new books, frequently utilized by binders for lining purposes

2. The extra sheets supplied to a binder to substitute in the event of spoilage.

3 Excess pieces of paper cut off by a binder

Watermark A device, or design, in a sheet of paper, which is made during the process of forming the sheet, representing a sort of trademark of the maker

Well. The open box under a cutting press utilized for catching waste

Whipping, or Whipstitching Same as overcasting

Whole binding A binding with spine and sides entirely covered with leather

Wing dividers Dividers the two prongs of which are held together and operated by a winglike curved bar

Wire marks. The lines made in a sheet of paper, while it is being formed, by the wires in the bottom of the "mould"

Wringing down As applied to a press — the act of bringing the two jaws or platens closer to each other

Wove paper. Paper made in a mould which has a bottom of woven wire screening similar to woven cloth fabric

Yawning boards Cover boards that curl away from the text of a book

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